# AN INVESTIGATION INTO THE EFFECTIVENESS OF SOCIAL STORIES WITH PHOTOGRAPH OR SYMBOL ILLUSTRATIONS FOR ADDRESSING THE SPECIFIC TARGET BEHAVIOURS OF CHILDREN WITH A DIAGNOSIS OF AUTISM SPECTRUM DISORDER

by

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# ABSTRACT

This study aimed to investigate the effectiveness of Social Stories utilising either photograph or symbol illustrations to address the target behaviours of children with a diagnosis of Autism Spectrum Disorder (ASD).

Multiple single-case experiments were conducted utilising an ABA design with 10 participants, all of whom were boys attending mainstream primary schools within a West Midlands Local Authority. The children ranged in age from 5-11 and all of them had a diagnosis and a primary need in relation to ASD.

Personalised Social Stories were composed for each of the participants to address a specific target behaviour that had been identified by the child and members of teaching staff. The stories were written by the researcher alongside a member of staff from the Local Authority's Autism Outreach Service and all adhered to the criteria and guidelines for construction outlined by Carol Gray (2004).The format for each of the stories was identical but for the manipulation of the illustrations.

The effectiveness of the intervention was monitored using a variety of measures including a Behaviour Log recording the frequency of the target behaviour across each of the experimental phases; the Strengths & Difficulties Questionnaire (Goodman, 1997); and a Teacher / Teaching Assistant Questionnaire that had been designed by the researcher and was based on items contained within the Behaviour Intervention Rating Scale (BIRS) (Elliot & Treuting, 1991). The data obtained from these measures was analysed through the visual inspection of graphical data and the calculation of effect sizes. Discussion is provided about the suitability, reliability and validity of each of the measures and the methods of data analysis.

Overall the study provides evidence of the utility and effectiveness of Social Stories for addressing the target behaviours of children with a diagnosis of ASD. Furthermore it offers an original contribution to the existing literature by exploring the impact of different forms of illustration on story efficacy.

# DEDICATION

I would like to dedicate this study to my nan, who passed away just a year after I had started the Doctorate course but who I know will have been looking down on me every step of the way.

# ACKNOWLEDGEMENTS

In completing this study, I owe a great many thanks to a great many people.

Firstly, I would like to thank all those who participated in the study. The dedicated and hard working teaching staff for meeting all the deadlines; the parents who consented for their children to take part; and the children themselves for their participation.

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Not for the first time, I would also like to thank all those who work at Dudley Educational Psychology Service. Special thanks go to Howard, for having faith in me from the start and giving me the opportunity to pursue a career in Educational Psychology; to Mary for being a wonderful Supervisor and a great friend; and to Dr Thistleton, Michelle, Dawn, Lisa, Caroline and Sian for their ongoing support.

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# CHAPTER 1: INTRODUCTION

The present study is situated in the context of changes to the training route for Educational Psychologists (EPs). From 2006 those wishing to join the profession were required to undertake a 3 year full time doctorate providing Trainees with the opportunity to engage in doctoral level research (www.bps.org.uk).

With the growing demand for evidence based practice (Frederickson, 2002) the National Collaborative Research Programme was developed to harness the potential of doctoral research studies to evaluate educational initiatives and interventions. This programme involved collaboration between Principal EPs and University tutors and the identification of priority research areas which it was hoped would contribute to the five Every Child Matters outcomes (DfES, 2003). One of these research areas was the '*Successful inclusion of children and young people with an Autism Spectrum Disorder (ASD)*'.

At the outset of this study, the Local Authority in which I was employed as a Trainee EP was in the process of developing specialist provision for children and young people with a diagnosis ASD. In discussion with the Principal EP and the Senior Practitioner EP, who held a specialist role within the Educational Psychology Service for ASD, it was agreed that undertaking research that focused on effective strategies for the inclusion of children with ASD would be beneficial in meeting local needs. This was propitious as the identification of effective interventions for supporting the needs of children with ASD was also an area of personal and professional interest for the researcher. Having been employed in the same LA as a teacher and a Special Educational Needs Co-ordinator (SENCo) in a mainstream primary school and as an Assistant EP, the researcher had regularly worked to support children and young people on the Autism Spectrum.

Consequently, this study focused on interventions aimed at successfully including children and young people with ASD and in particular, the effectiveness of Social Stories.

# CHAPTER 2: LITERATURE REVIEW

## 2.1. Introduction to Literature Review

The first part of this Literature Review will explore the current knowledge base underpinning our understanding of the Autism Spectrum and of Social Story interventions. The researcher will then conduct a systematic review of the research literature evaluating the effectiveness of Social Stories.

## 2.2. The Autism Spectrum

Although it seems likely that there have always been children and adults with needs that lie along the 'Autism Spectrum' (Wing, 1996) the term autism did not emerge until 1911 when Bleuler used it to refer to children who had withdrawn from participation in the social world (Cumin, Leach & Stevenson; 1998).

Autism was only defined as a condition in the early 1940s as a result of a study written by Leo Kanner, a Child Psychiatrist in the USA. Kanner published a paper based upon the observations of 11 children whom he believed shared similar characteristics that set them apart from others (Jordan, 1999). Kanner (1943) considered the following to be the defining characteristics of the syndrome:

- A profound autistic withdrawal
- An obsessive desire for the preservation of sameness
- A good rote memory
- An intelligent and pensive expression
- Mutism, or language without real communicative intent
- Over sensitivity to stimuli
- A skilful relationship to objects

(Jordan, 1999)

Conclusions drawn from case study analyses of such a small sample of just 11 children must be treated with caution, but Kanner's description of these characteristics represented an important first attempt at the formulation of criteria for a diagnosis of autism. His work also generated interest from other professionals working with children and in 1944 Hans Asperger an Austrian Paediatrician published a paper entitled 'Autistic psychopathies in childhood' in which he described a group of 4 boys who presented with:

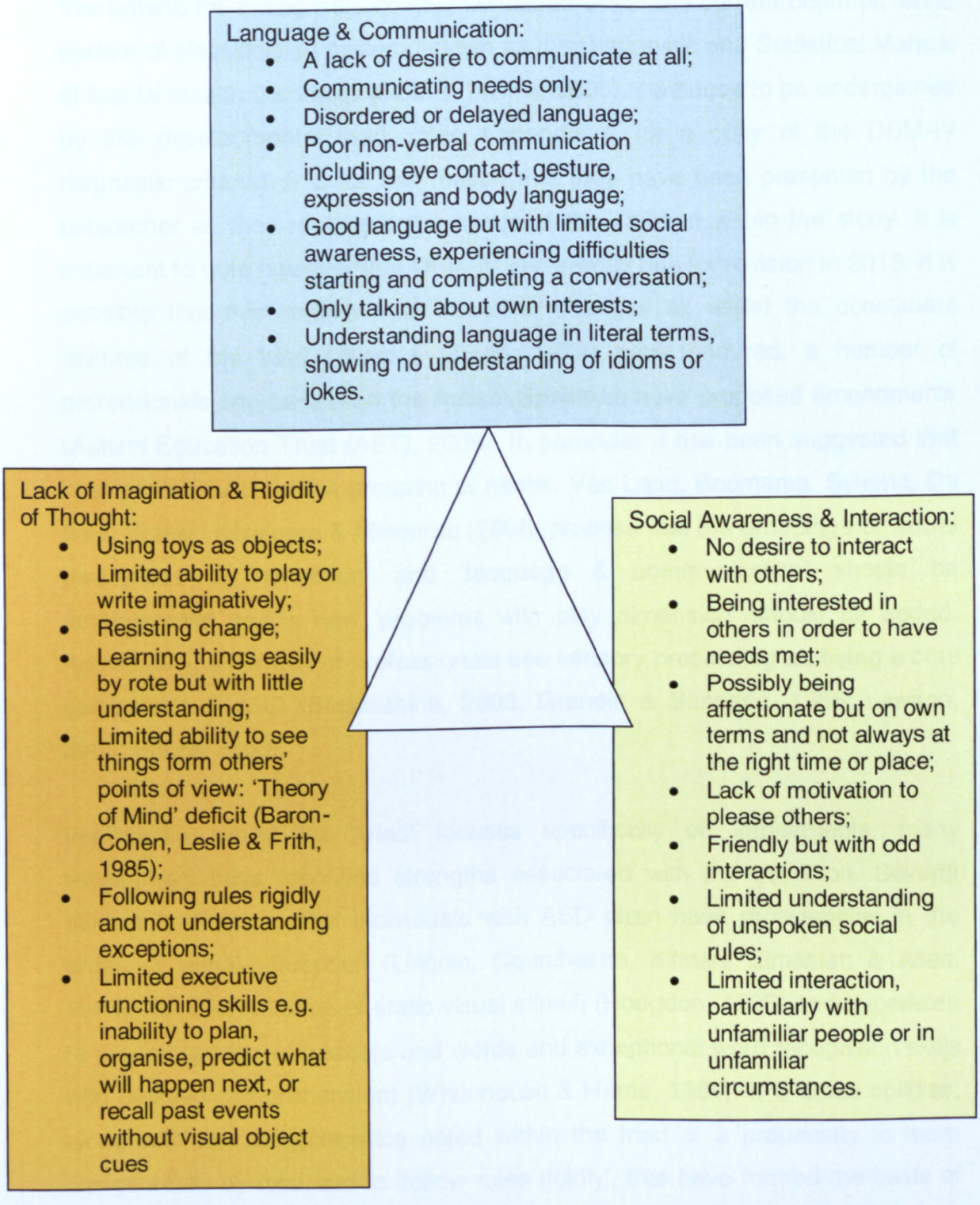
- Inappropriate social approaches to others;
- Intense interest in particular subjects;
- Good grammar and vocabulary;
- Monotone speech;
- Poor conversational skills;
- Poor motor co-ordination;
- A lack of common sense;
- A level of learning ability that was within the borderline, average or above average range.

(Wing, 1996)

Asperger recognised that there were similarities between his syndrome and Kanner's but believed there were also significant differences, an assertion that is characteristic of the divergence of opinions relating to the definition of autism (Wing, 1996). Again, the findings were limited by the small number of children involved in the study.

In an attempt to clarify some of these ambiguities, Wing & Gould (1979) conducted research in the London borough of Camberwell, examining the nature of the difficulties of a group of 15 children who had been referred for psychiatric help. Within this group they found children who displayed many of the features of Kanner's autism and of the features noted by Asperger and concluded that both of these aforementioned syndromes represented sub-groups of children existing along a continuum. In spite of the limited sample, the findings of this study have been fundamental to our understanding of autism. They led to the development of 'the Autism spectrum' a term used to this day to

describe the variation in the presenting features of individuals who display a 'triad of impairments' (Wing & Gould, 1979) in the areas of social awareness and interaction, communication and language and imaginative thought (see Figure 2.2.1).




(Taken from Ali & Frederickson, 2006, page 356)

**Figure 2.2.1: The 'Triad of Impairments' (Wing & Gould, 1979)**

The criteria for a diagnosis of ASD contained within the current common world system of classification system, known as the Diagnostic and Statistical Manual of Mental Health Disorders (DSM-IV) (APA, 2000), continues to be underpinned by this developmental triad. (See Appendix A for a copy of the DSM-IV diagnostic criteria). It is for this reason that they have been presented by the researcher as they represent the needs of the children within the study. It is important to note however that DSM-IV is currently due for revision in 2013. It is possible that this revision may result in changes as whilst the constituent features of the triad (Wing & Gould, 1979) have endured, a number of professionals and people on the Autism Spectrum have proposed amendments (Autism Education Trust (AET), 2008). In particular it has been suggested that changes be made to the grouping of needs. Van Lang, Boomsma, Sytema, De Bildt, Kraijer, Ketelaars & Minderaa (2006) propose that the groupings of 'social awareness & interaction' and 'language & communication' should be amalgamated and a new 'problems with play dimension' should be added. Additionally, a number of professionals see sensory processing as being a core component of ASD (Bogdashina, 2003; Grandin & Scariano, 1986; Lawson, 2003; Shore, 2003).

Importantly, whilst the 'triad' focuses specifically on impairments, many researchers have identified strengths associated with the condition. Several studies have found that individuals with ASD often have proficiencies in the areas of visual-perception (Lincoln, Courchesne, Kilman, Elmasian & Allen, 1988), the interpretation of static visual stimuli (Hodgdon, 1995) and hyperlexia (a pre-occupation with letters and words and exceptional word recognition skills with delayed comprehension) (Whitehouse & Harris, 1984). It is these abilities, along with the characteristics noted within the triad of a propensity to learn 'things easily by rote' and to 'follow rules rigidly', that have formed the basis of many of the strategies that have been developed to support individuals with ASD. Indeed, the use of visual written and pictorial cues (Kistner, Robbins & Haskett, 1988; Krantz & McClannahan, 1993) have been shown to improve the social communication skills of children with an ASD.

What is clear from this discussion is that the ASD population is a heterogeneous one which includes individuals with a range of needs and skills. This is largely a consequence of the fact that ASD is the umbrella term that was introduced by Wing (1996) to encompass all of the different subgroups that exist along the spectrum from Kanner's (1943) Autism to Asperger's (1944) syndrome (AET, 2008). Although the DSM-IV criteria suggests separate diagnostic categories for the conditions that lie along this 'spectrum', there is a growing consensus that the broad category of Autistic Spectrum Disorders is the most pragmatically appropriate for planning and delivering services to children on the autism spectrum (AET, 2008; DfES, 2002; Jordan, Jones & Morgan, 2001) and as such it will be the term ASD that is referred to in the current study.

## 2.3. Autism Spectrum Disorder or Autism Spectrum Condition? An Exploration of Terminology

At present there is considerable debate amongst professionals about whether the term Autism Spectrum Disorder (ASD) or Autism Spectrum Condition (ASC) should be used. As Jordan (2007) highlights, this is a key issue as there is a need to balance a respect for the wishes of the more able group within the spectrum, while not depriving others of much needed resources. In their review of educational provision for children and young people on the autism spectrum, the Autism Education Trust (AET, 2008) emphasize the importance of a label in providing effective support even for the group of individuals who feel their main difficulties stem from failures within the mainstream society to adapt to their differences.

Bearing these views in mind it has been proposed that the term ASC be applied to those whose development and functioning is not compromised by their autism providing their differences are responded to. The term ASD would then apply to those whose functioning was compromised even within a supportive environment. These terms could then be used flexibly, with those with an ASC being vulnerable to developing an ASD if they were not supported and those

with an ASD acquiring the label of ASC if they are well supported and as a consequence are no longer disadvantaged by their differences.

Whichever term is adopted, it seems likely that little will be achieved unless attitudes to children and young people with autistic spectrum needs and the systems of resource allocation change. In fact, the AET (2008) report argues that the adoption of specific terminology is unlikely to achieve anything except further confusion suggesting that professionals should concentrate instead on developing a greater understanding of the variety that exists along the autism spectrum in order that resources and support can be allocated appropriately to meet the needs of individuals.

Having considered the current debates, the researcher has decided to adopt the label *Autism Spectrum Disorder* (ASD) as this remains the terminology that is utilised within DSM-IV.

## 2.4. Prevalence

In recent years there has been general agreement amongst health and education professionals that there has been an increase in the number of children diagnosed with Autism Spectrum Disorder (ASD). There is a suggestion that this may be the result of the broadening of the diagnostic criteria (Jordan, 2005; 2007) but whatever the reason, prevalence figures are now believed to be approximately 1 in 100 (Baird, Simonoff, Pickles, Chandler, Loucas, Meldrum & Charman, 2006). The National Autistic Society (www.nas.org.uk a) state that there are currently approximately 133,500 children under the age of 18 with ASD and suggest that boys are four times more likely to receive a diagnosis than girls. Whilst, recent government statistics (DCSF, 2009) reveal that 6.2% of the children in mainstream primary schools who have an identified special educational need have a primary need of an ASD.

## 2.5. Educational Provision

In their report, the Autism Education Trust (AET, 2008) reported that there are clear differences in the ways local authorities endeavour to meet the needs of children on the Autism Spectrum. In some cases, children will attend generic special schools and in others they will attend a school or unit which specialises in autism. However, with the policy to include pupils with SEN in mainstream schools whenever possible, many children with ASD will be educated within these settings with additional support. This places an increased pressure on settings and professionals to develop a range of appropriate strategies and interventions (Ali & Frederickson, 2006) as "given the diversity within the spectrum and between individuals, there is no single educational intervention that is useful for all children on the autism spectrum and there is no single intervention that would on its own be sufficient to meet all the needs of a particular child on the autism spectrum" (AET, 2008, page 14).

With this in mind Jones (2002) highlights the need to deal with each case on an individual basis, although she points out that an understanding of the general areas in which a pupil with ASD differs from other children can be helpful when devising programmes in school. She suggests that evidence from research and practice has identified a number of common principles which make sense for the majority of pupils on the Autism Spectrum and which underpin good practice.

In particular Jones (2002) claims that it is the nature of the social difficulties that is the most problematic due to the social demands of a school environment. Consequently, a number of the approaches that have been developed have targeted social understanding. Over recent years a number of social skills programmes have become commercially available e.g. Socially Speaking (Schroeder, 1997), Talkabout (Kelly, 1996) and the Social Use of Language Programme (Rinaldi, 1992). However, as Smith (2001) indicates there can be significant difficulties delivering such programmes in mainstream schools as they often rely on small group work which can be difficult to co-ordinate. One popular alternative is the use of Social Stories.

## 2.6. Social Stories

### 2.6.1. What are Social Stories?

Social Stories were originally developed by Carol Gray in America in 1991 with the aim of helping individuals with ASD (Gray, 1994). Their popularity and widespread use has necessitated regular reviews of the defining characteristics and guidelines of the approach and in her most recent publication 'Social Stories™ 10.0', (Gray 2004) she suggests that whilst people with ASD remain the primary audience, they may also be helpful for individuals with other needs as well as for those who are developing normally.

A Social Story is a short story that is written to describe and explain what happens in a particular social situation in which an individual is encountering difficulties. Their aim is not to change the individual's behaviour, but to improve their understanding of events and expectations in order that they may produce more effective responses (Gray, 2000).

It is claimed that Social Stories can be utilised to address a variety of needs in schools, such as helping children to follow rules and routines, supporting transitions, increasing appropriate behaviours, decreasing inappropriate behaviours and teaching skills related to specific curriculum objectives (Gray, 2004). In addition, Gray & Garand (1993) assert that generic Social Stories can be used to describe frequently occurring social situations although they state that these should be individualised and adapted to meet the needs of the child.

### 2.6.2. How do you write a Social Story?

Gray (1995) recommends that each Social Story should be personalised following a detailed assessment of an individual's needs. She highlights the requirement for specificity when identifying the problem area and suggests that pupils should be included in the story development in order that their views and level of comprehension are taken into account.

Having identified the area of difficulty, Gray (2004) goes on to give detailed instructions for writing Social Stories outlining 10 characteristics that should guide the author. These have been outlined in Table 2.6.3.

Guidelines state that the stories should be compiled from six basic sentence types (Gray, 2004) which are outlined in Table 2.6.4 and that these should be applied at a ratio of two to five co-operative, descriptive, perspective and/or affirmative sentences for every directive or control sentence.

Initially it was suggested that the stories should not contain illustrations as these could be distracting (Gray & Garand, 1993). However this advice has since been revised (Gray, 2003) and the use of personalised illustrations is now considered to be beneficial to social understanding. This revision would seem appropriate when we consider the aforementioned research (see section 2.2) that indicates that children with ASD have skills in the area of visual -perception (Lincoln et al, 1988) and the interpretation of static visual stimuli (Hodgdon, 1995).

Gray (2004) suggests that illustrations can take the form of drawings, photographs, objects or PowerPoint™ presentations. See Table 2.6.1.

| Type of illustration | Nature of illustration |
|---|---|
| Drawings | Images that we create or that we produce through computer programs to illustrate specific situations. |
| Photographs | Photographs that are taken to illustrate specific situations. |
| Objects | Physical objects that are fastened to the Social Story to illustrate specific situations. |
| PowerPoint™ | Stories are created on a PowerPoint™ presentation that the child accesses on the computer. |

(Taken from Social Stories™ 10.0 page 8; Gray, 2004)

**Table 2.6.1: A summary of the descriptions given for the different methods of illustrating a Social Story**

The guidance on the use of illustrations falls short of recommending one form over another, although Gray (2004) does offer advice on the factors she believes should influence the selection, suggesting that the author of the story asks themselves the following questions (Table 2.6.2).

| | |
|---|---|
| a. | Does the child have the prerequisite skills and understanding to make the connections between the text and type of illustration? |
| b. | Has the child previously demonstrated interest in this type of illustration? |
| c. | Is a combination of materials the best illustration method for this child? |

(Taken from Social Stories™ 10.0 page 8; Gray, 2004)

**Table 2.6.2: A summary of the guidance given for selecting a method of illustration for a Social Story**

In addition to these factors, the selection of illustrations should be based on the best available research evidence. One recent study investigating the nature of ASD children's understanding of different forms of pictures has uncovered evidence to suggest that they have some difficulty linking pictures to real world referents (Allen, 2009). In contrast they have no problems in relating their own artwork, leading the author to conclude that for children with ASD an understanding of artwork is underpinned by intentionality.

This finding has implications for the form of illustrations utilised in Social Stories and would suggest that children should be involved in the selection and production of pictures.

| | |
|---|---|
| 1 | A Social Story meaningfully shares social information with a patient and reassuring quality, and at least 50% of all Social Stories applaud achievements. |
| 2 | A Social Story has an introduction that clearly identifies the topic, a body that adds detail, and a conclusion that reinforces and summarizes the information. |
| 3 | A Social Story answers 'wh' questions. |
| 4 | A Social Story is written from a first or third person perspective. |
| 5 | A Social Story uses positive language. |
| 6 | A Social Story always contains descriptive sentences, with an option to include any one of the five remaining sentence types (Perspective, co-operative, directive, affirmative, and/or control sentences). |
| 7 | A Social Story describes more than directs, following the Social Story formula. |
| 8 | A Social Story has a format that is tailored to the abilities and interests of its audience, and is usually literally accurate. |
| 9 | A Social Story may include individually tailored illustrations that enhance the meaning of text. |
| 10 | A Social Story title meets all applicable Social Story Criteria. |

(Taken from Social Stories™ 10.0 page 8; Gray, 2004).

**Table 2.6.3: A summary of the 10 defining criteria & guidelines for constructing and implementing Social Stories**

| Type of sentence | Nature of sentence |
|---|---|
| Descriptive sentences | These are factual statements that are free of opinions and/or assumptions. |
| Perspective sentences | These are statements that refer to or describe a person's internal state, their knowledge/thoughts, feelings, beliefs, opinions, motivation or physical condition/health. |
| Co-operative sentences | These sentences identify what others will do to assist the child. |
| Directive sentences | These sentences identify a suggested response or choice of response to a situation or concept, gently guiding the child's behaviour. |
| Affirmative sentences | These sentences enhance the meaning of surrounding statements and often express a commonly shared value or opinion within a given culture. |
| Control sentences | These are statements written by the child to identify personal strategies for recalling and applying Social Story information. |

(Taken from Social Stories™ 10.0 page 8; Gray, 2004).

**Table 2.6.4: A summary of the six basic sentence types comprising Social Stories.**

### 2.6.3. How do you implement a Social Story?

Following construction, Gray & Garand (1993) go on to provide guidance on how they should be implemented.

It is suggested that only one story be introduced at any one time in order to avoid overwhelming the child (Gray, 1994).

Three different options are then offered for the administration of the story. Firstly, for children who are capable of reading, it is suggested that once the teacher has read the story for the first time, the child can continue to read it independently. Secondly, for children who are unable to read, the story can be read by an adult or a peer, recorded using a tape recorder or presented using PowerPoint™ (Gray, 2004). After the first reading of the story it is anticipated that children should be administered a series of comprehension questions to ensure understanding.

It is recommended that the story is read and reviewed at a consistent time on a regular basis (possibly daily) in a quiet, comfortable and distraction free environment (Gray, 1994).

Finally, once a child appears to have developed the skills and understanding being taught within the story, it can be faded out (Gray, 1994). This process of fading could involve an increase in the period of time between reviewing the story or a change in the content e.g. the removal of directive sentences.

### 2.6.4. How do Social Stories help individuals with ASD?

The stories are believed to be effective in helping individuals with ASD as they address some of the needs that arise from the aforementioned 'triad of impairments' (Wing & Gould, 1979) (see Figure 2.2.1).

The perspective sentences are thought to address the social cognitive difficulties that result from the difficulties that individuals with ASD have in seeing things from other people's points of view (Greenway, 2000), a difficulty referred to as the 'Theory of Mind' deficit (Baron-Cohen, Leslie & Frith, 1985).

By incorporating perspective sentences that refer to or describe another person's internal state, Social Stories are thought to help children with ASD to appreciate other people's intentions, beliefs, needs and desires (Greenway, 2000).

Other researchers suggest that Social Stories support individuals with ASD as they present information in a literal, concrete and accurate manner improving their understanding of a previously ambiguous situation or activity (www.nas.org.uk b). In this way they offer access to a social skills curriculum that is understood innately by others but which is hidden for children on the Autism Spectrum (Myles & Simpson, 2001). By providing information about what the individual can expect in a particular social situation, Social Stories give a structure to activities helping individuals to anticipate what will happen next and supporting executive functioning (planning and organisational skills) (www.nas.org.uk b).

Smith (2001) points out further benefits of Social Stories, highlighting the fact that they build upon the strengths of children with ASD as they are visual, permanent, simple, explicit and situation specific. Furthermore, she notes that the development and implementation of stories can promote changes in the attitudes and responses of those who work to support children with ASD by enhancing their understanding of the child's needs (Smith, 2001). Finally, the unobtrusive and convenient nature of the intervention, which negates the need for the child to be withdrawn from the classroom, minimises the potential for further social isolation. As Scattone, Wilczynski, Edwards & Rabian, (2002) suggest the best interventions are those that are most effective and least intrusive, a sentiment echoed in Division of Child and Educational Psychology (DCEP) Guidelines for Professional Practice (BPS, 2002) which states that Educational Psychologists should consider the use of the least intrusive interventions before embarking on a more intrusive course of action.

### 2.6.5. What is the evidence base of Social Stories?

The Social Story approach is growing in popularity and there is a considerable literature providing guidance on their composition and implementation. However, two recent reviews of the research (Ali & Frederickson, 2006; Reynhout & Carter, 2006) have identified that there is currently a limited empirical evidence to support their effectiveness. In the remainder of this chapter, the researcher intends to conduct her own review of studies relating to Social Story interventions in the hope of clarifying the current knowledge base and identifying areas for further investigation.

## 2.7. Systematic Literature Review

This section will report on a systematic review of the research literature evaluating the effectiveness of Social Stories.

Systematic literature reviews provide a useful method for evaluating large bodies of information. This is considered to be beneficial as there a very few studies that are considered to be methodologically rigorous enough and which yield results that are so generalisable that they engender enough confidence for us to accept their findings as unequivocal (Petticrew & Roberts, 2006).

Unlike traditional reviews, they aim to produce a scientific summary of the research by adopting a particular methodology to answer specific questions about causation or effectiveness. Where there is considerable uncertainty or insufficient research into an area of study, systematic reviews offer a valuable mechanism for reviewing the evidence. At a time when education professionals and policy makers are being asked to demonstrate that their practices are evidence based, systematic reviews provide an important source of research information. For any given topic, they can identify the current evidence, highlight any inconsistencies within it, and reveal anything that remains unexplored and unknown (Petticrew & Roberts, 2006).

## 2.8. Systematic Search

In order to review the existing research and evidence base related to the effectiveness of Social Story interventions, a systematic search was undertaken.

Having conducted an initial keyword search for 'social stories' using Google Scholar and the PsychInfo and ERIC (CSA) databases, 95 papers were identified. The search was then refined by the application of specific inclusion criteria aimed at identifying those papers which addressed the aims of the current study. Figure 2.8.1 provides a flowchart highlighting the application of the specific inclusion criteria that were used to refine the search whilst Table 2.8.1 provides the rationale for the selection of these criteria.

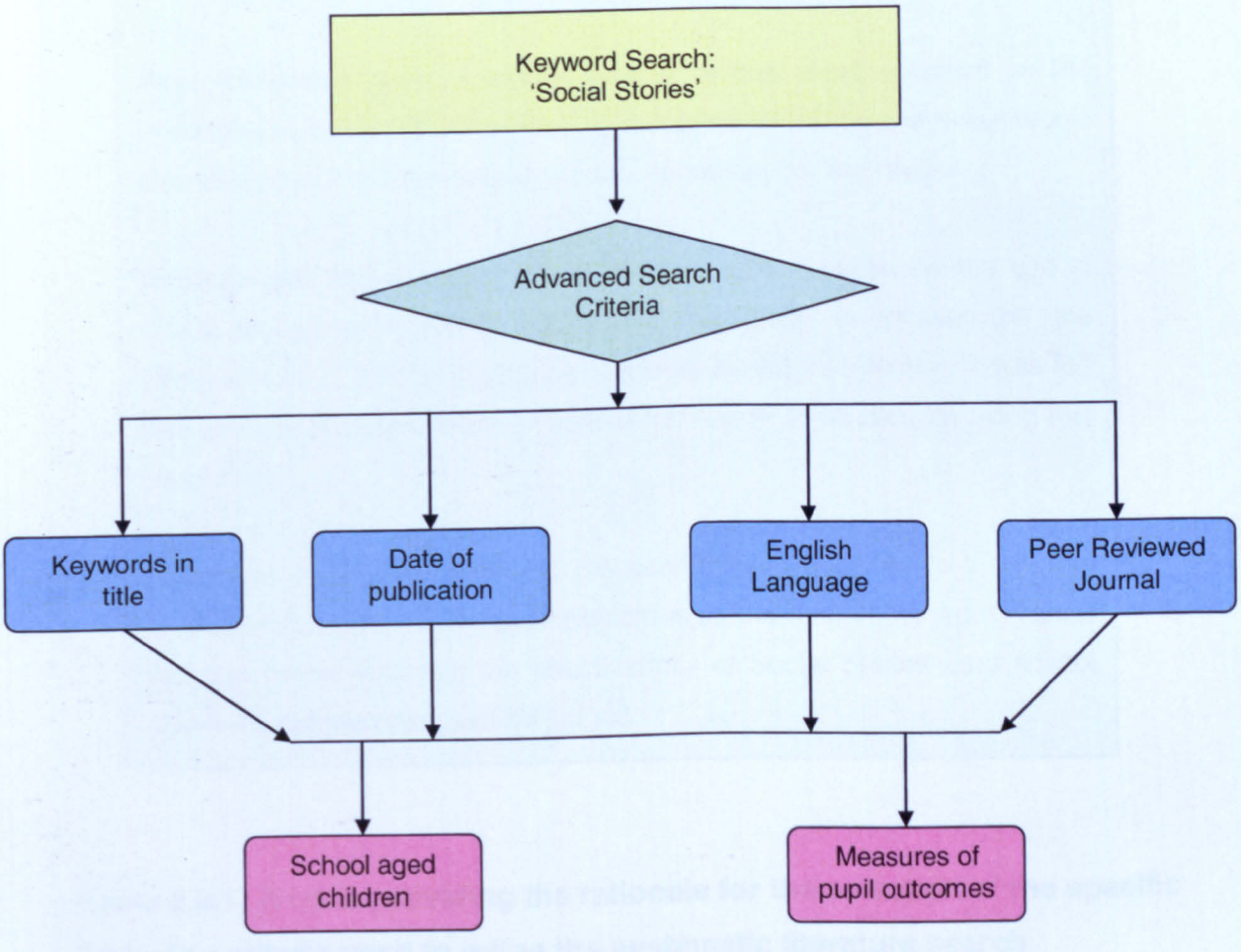



**Figure 2.8.1. A flowchart illustrating the systematic search strategy used to identify studies to be included in the literature review**

**Keywords in title:** in order to ensure that the articles obtained would be those that were most relevant to the study of 'Social Stories' the search was refined by specifying that the words should be present in the title of the article.

**Date of publication:** as the 'Social Story' approach was not developed until the early 1990's and as any literature review should draw upon recent research, the search was restricted to those references that had been published between 1990 and 2010.

**English language:** the search was limited to those studies that had been written in the English language.

**Peer. Reviewed Journal article:** journal articles were specified as the initial search produced references to a number of books and these would not have provided the research studies necessary for the review.

**School aged children:** a number of the studies focused on the use of social stories with young adults. As this study is focused on the effectiveness of Social Stories as a school based intervention it was felt that it would be appropriate to restrict the review to studies involving this population.

**Measures of pupil outcomes:** the search was restricted to those that provided information about pupil outcomes as the researcher would assert that it is in this way that the effectiveness of Social Stories as a school based intervention can best be judged.

**Table 2.8.1. A table providing the rationale for the selection of the specific inclusion criteria used to refine the systematic literature search**

Having applied the inclusion criteria, 29 research studies were selected. An overview of each of these studies (listed in chronological order) providing information about participants, methodology, target behaviours, procedures and results can be found in the table in Appendix B.

Aspects of these 29 studies will now be considered in greater detail in the synthesis of the literature in section 2.9. Having reviewed these papers, the findings will be considered alongside those obtained from two existing literature reviews (Ali & Frederickson, 2006; Reynhout & Carter, 2006) in order to draw comparisons, identify key areas for further study and develop specific research questions.

## 2.9. Synthesis of the Literature

The following section provides a narrative account of the research articles identified from the systematic literature review. It will start with an overview of the results obtained from these studies, before going on to provide information relating to different themes and aspects of the research. In this way, the reader will be provided with a detailed overview of the existing literature, in which the strengths and limitations of previous studies are highlighted and the gaps in the knowledge base pertaining to Social Stories are identified. The narrative will conclude with a summary of the findings of the review leading to the development of the research questions to be explored within the current study.

### 2.9.1. Social Story Efficacy

| | |
|---|---|
| Social Stories found to effective | Barry & Burlew, 2004; Bledsoe, Myles & Simpsol, 2003; Chan & O'Reilly, 2008; Delano & Snell, 2006; Ivey, Heflin & Alberto, 2004; Kalyva & Agaliotis, 2009; Kuoch & Mirenda, 2003; Kuttler et al, 1998; Ozdemir, 2008; Quirmbach, Lincoln, Feinberg-Gizzo, Ingersoll & Andrews, 2009; Reynhout & Carter, 2007; Richmond-Mancil, Haydon & Whitby, 2009; Rowe, 1999; Sansosti & Powell-Smith, 2008; Scattone, Wilczynski, Edwards & Rabian, 2002; Schneider & Goldstein, 2009; Swaggart, Gagnon, Bock, Earles, Quinn, Myles & Simpson, 1995; Thiemann & Goldstein, 2001;Whitehead, 2007 |
| Social Stories found to be effective for particular individuals | Abraham, 2009; Crozier & Tincani, 2007; Sansosti & Powell-Smith, 2006; Scattone, Tingstrom & Wilczynski, 2006; Smith, 2001; Toplis & Hadwin, 2006; Wright, 2009 |
| Social Stories found to be effective only for particular behaviours | Scattone, 2008 |
| Social Stories found to be effective only in particular contexts | Hagiwara & Myles, 1999; O'Connor, 2009 |

**Table 2.9.1: A table providing a summary of the findings relating to the efficacy of the Social Story interventions in the reviewed studies**

Of real significance to the current study is that of the 29 studies included within the systematic review, 19 reported Social Stories to have been effective in addressing the behaviours of the children for whom they were written. The remaining 10 studies found Social Stories to be effective either for particular participants, particular behaviours or in particular contexts (issues which will be explored in greater detail throughout the rest of this Chapter).

### 2.9.2. Participants

One of the key themes emerging from the research literature concerns the characteristics of the participants. This is of significant professional interest as if we are to be confident in recommending the approach we need to be clear which individuals are most likely to benefit from Social Stories.

In particular the studies included in this review focus on the effectiveness of the intervention for children of all ages and with and without a diagnosis of ASD. Table 2.9.2 provides a summary of the ages and needs of the children involved in the reviewed literature.

| | |
|---|---|
| Children of pre-school age | Crizier & Tincani, 2007; Kuoch & Mirenda, 2003; |
| Children of primary school age | Barry & Burlew, 2004; Chan & O'Reilly, 2008; Delano & Snell, 2006; Hagiwara & Myles, 1999; Ivey et al, 2004; Kalyva & Agaliotis, 2009; Kuoch & Mirenda, 2003; O'Connor, 2009; Ozdemir, 2008; Quirmbach et al, 2009; Reynhout & Carter, 2007; Richmond Mancil et al, 2009; Rowe, 1999; Sansosti & Powell-Smith, 2006; Sansosti & Powell-Smith, 2008; Scattone, 2008; Smith, 2001; Scattone et al, 2002; Scattone et al, 2006; Schneider & Goldstein, 2009; Swaggart et al, 1995; Toplis & Hadwin, 2006; Thiemann & Goldstein, 2001; Whitehead, 2007 |
| Children of secondary school age | Bledsoe et al, 2003; Kuttler et al, 1998; Quirmbach et al, 2009; Scattone et al, 2002; Scattone et al, 2006; Smith, 2001; Thiemann & Goldstein, 2001 |
| Children with a diagnosis of ASD | Abraham, 2009; Barry & Burlew, 2004; Bledsoe et al, 2003; Chan & O'Reilly 2008; Crozier & Tincani, 2007; Delano & Snell, 2006; Hagiwara & Myles, 1999; Ivey et al, 2004; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Ozdemir, 2008; Reynhout & Carter, 2007; Richmond-Mancil et al, 2009; Rowe, 1999; Sansosti & Powell-Smith, 2006; Sansosti & Powell-Smith, 2008; Quirmbach et al, 2009; Scattone et al, 2006; Scattone et al, 2002; Scattone, 2008; Scneider & Goldstein, 2009; Swaggart et al, 1995; Smith, 2001; Theimann & Goldstein, 2001, Wright, 2009. |
| Children with social, emotional and behavioural needs but without a diagnosis of ASD | Toplis & Hadwin, 2006; Whitehead, 2007 |
| Children with learning needs but without a diagnosis of ASD | Kalyva & Agaliotis, 2009; Whitehead, 2007 |

**Table 2.9.2: A table providing a summary of the ages and needs of the participants involved in the reviewed studies**

#### 2.9.2.1. Age

The studies reported here found Social Stories to be an effective intervention for supporting pre-school children from as young as 3 (Kuoch & Mirenda, 2003) to secondary school children as old as 15 (Scattone et al, 2002) indicating that the stories can be utilised in pre-school, primary and secondary school settings.

#### 2.9.2.2. Children with and without a diagnosis of an Autism Spectrum Disorder

As stated previously, Social Stories were originally developed to support the needs of individuals on the Autism Spectrum (see section 2.6.1). It is unsurprising therefore that the vast majority of the studies in the review (26 out of 29) involved a child or children with a diagnosis of Autism, Asperger's Syndrome or Pervasive Developmental Disorder. The results for 22 of these studies indicated that Social Story interventions have proven to be effective for all of the participants (Abraham, 2009; Barry & Burlew, 2004; Bledsoe et al, 2003; Chan & O'Reilly 2008; Delano & Snell, 2006; Ivey et al, 2004; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Ozdemir, 2008; Richmond-Mancil et al, 2009; Rowe, 1999; Sansosti & Powell-Smith, 2008; Quirmbach et al, 2009; Scattone et al, 2006; Scattone et al, 2002; Scattone, 2008; Scneider & Goldstein, 2009; Swaggart et al, 1995; Smith, 2001; Theimann & Goldstein, 2001, Wright, 2009). Furthermore, the approach was also considered to be effective by teaching staff and parents (Ozdemir, 2008; Smith, 2001).

The remaining four studies yielded mixed results raising questions about the extent to which the improvements in social behaviour were maintained following the withdrawal of the Social Story (Sansosti & Powell-Smith, 2006) and the population of children with ASD for whom Social Stories are most effective. In particular Social Stories were found to be less effective for children with poor communication skills (Crozier & Tincani, 2007) and to be more effective where levels of comprehension were higher (Reynhout & Carter 2007).

Of considerable interest is the finding that three of the studies involved children who did not have a diagnosis of ASD. These children were reported to have either social, emotional and/or behavioural needs (Toplis & Hadwin, 2006;

Whitehead, 2007) or learning needs (Kalyva & Agliatis, 2009; Whitehead, 2007) and all of them were presenting with difficulties in particular social situations.

In her revision of the guidelines relating to Social Stories, Gray (2004) widened out the potential audience for the intervention from those with a diagnosis of ASD to children with other needs and those who were developing normally (see section 2.6.1).The findings of the study by Kalyva & Agaliotis (2009) would seem to offer some justification of this revision, as they claimed that Social Stories provided a potent tool for improving the social skills of children with learning difficulties. The results of the Toplis and Hadwin (2006) and Whitehead (2007) studies were however, more equivocal.

In their study, Toplis & Hadwin (2006) found that Social Stories were only beneficial in increasing appropriate behaviours for three out of the five children who received the intervention. The profile of scores from the Conners Teacher Rating Scale-Revised (CTRS-R) (Conners, Sitarenios, Diamond & Powell, 1998) and social cognitive tasks indicated that Social Stories were most effective for those children who had difficulties with social skills and with understanding other people's perspectives. Similarly, Whitehead (2007) established that the Social Story intervention was most effective for the child with moderate learning difficulties who, according to his teacher, had difficulties considering other people's feelings. Such findings are consistent with the assertion that Social Stories provide a useful tool to facilitate a child's understanding of their social world (Kuttler et al, 1998; Toplis & Hadwin, 2006).

### 2.9.3. Target behaviours

Another important finding is that, on balance, the results of the studies appear to support Gray's (2004) claim that Social Stories can be utilised to address a variety of needs and behaviours. Table 2.9.3. provides a summary of the range of behaviours that were targeted for intervention.

| | |
|---|---|
| Social Skills e.g. Communication, Interaction and Play Skills | Abraham, 2009; Barry & Burlew, 2004; Chan & O'Reilly, 2008; Crozier & Tincani, 2007; Delano & Snell, 2006; Kuoch & Mirenda, 2003; O'Connor, 2009; Quirmbach et al, 2009; Sansosti & Powell-Smith, 2008; Scattone et al, 2006; Scattone, 2008; Swaggart et al, 1995, Thiemann & Goldstein, 2001; Wright, 2009. |
| Classroom behaviours e.g. on-task behaviour, shouting out | Chan & O'Reilly, 2008; Hagiwara & Myles, 1999; Ozdemir, 2008; Reynhout & Carter, 2007; Richmond-Mancil et al, 2009; Scattone et al, 2002; Schneider & Goldstein, 2009; Whitehead, 2007 |
| Self-help and Independence Skills | Bledsoe et al, 2003; Hagiwara & Myles, 1999; Whitehead, 2007 |
| Lunchtimes, Playtimes and Novel events | Ivey et al, 2004, Ozdemir, 2008; Rowe, 1999; Sansosti & Powell, 2006; Toplis & Hadwin, 2006 |
| Tantrum behaviour & Conflict Resolution | Kalyva & Agaliotis, 2009; Kuttler et al, 1988 |

**Table 2.9.3: A table providing a summary of the target behaviours addressed within the reviewed studies**

It is clear that the majority of the Social Stories evaluated in these studies were written to target social behaviours such as communication, interaction and play skills. However, a number of stories targeted specific classroom behaviours such as on-task behaviour (Hagiwara & Myles, 1999; Schneider & Goldstein, 2009), tipping a chair backwards (Ozdemir, 2008; Scattone et al, 2002) shouting out in maths, staring inappropriately at girls during registration (Scattone et al, 2002), sitting appropriately during morning circle (Crozier & Tincani, 2007), tapping hands during reading (Reynhout & Carter, 2007), disrupting other children during lessons (Whitehead, 2007), appropriate hand raising, pushing

other children (Richmond-Mancil et al, 2009) and inappropriate vocalisations (Chan & O'Reilly, 2008; Ozdemir, 2008).

Of the remaining studies, three employed stories to support self help and independence skills such as learning to wash hands independently (Hagiwara & Myles, 1999), developing personal organisational skills (Whitehead, 2007) and addressing eating related problems (Bledsoe et al, 2003). A further three aimed to develop children's understanding of routines and appropriate behaviour during lunchtimes, playtimes and novel events (Ivey et al, 2004, Ozdemir, 2008; Rowe, 1999; Sansosti & Powell, 2006; Toplis & Hadwin, 2006). Whilst two were used to address precursors to tantrum behaviour (Kuttler et al, 1988); and to help children to choose more appropriate interpersonal conflict resolution strategies (Kalyva & Agaliotis, 2009). Smith's (2001) group case study evaluated the impact of Social Stories on a variety of behaviours.

Notably, none of the reviewed studies evaluated the effectiveness of Social Stories for teaching skills related to specific curriculum objectives, a purpose for which Gray has suggested they could be utilised (Gray, 2004).

### 2.9.4. Story Construction & Presentation

As stated previously (section 2.6.2) Gray (1995) gives detailed instructions for writing Social Stories. Despite these clear guidelines, the research conducted to date has been criticised for failing to adhere to Gray's recommendations (Kuoch & Mirenda, 2003). This finding along with other issues relating to the construction and presentation of Social Stories have been summarised in Table 2.9.4.

| | |
|---|---|
| Social Stories written in adherence with Gray's (1995) basic Social Story formulation | Bledsoe et al, 2003; Chan & O'Reilly, 2008; Crozier & Tincani, 2007; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Ozdemir, 2008; Rowe, 1999; Richmond-Mancil et al, 2009; Scattone et al, 2002; Scattone et al, 2008; Schneider & Goldstein, 2009; Smith, 2001; Theimann & Goldstein, 2001; Toplis & Hadwin, 2006; Whitehead, 2007 |
| Social Stories utilising visual symbols, photographs and drawings | Bledsoe et al, 2003; Crozier & Tincani, 2007; Kuoch & Mienda, 2003; Kuttler et al, 1998; Hagiwara & Myles, 1999; Ozdemir, 2008; Richmond-Mancil et al, 2009; Schneider & Goldstein, 2009; Swaggart et al, 1995; Theimann et al, 2001; Whitehead, 2007 |
| Social Stories presented on a computer | Hagiwara & Myles, 1999; Richmond-Mancil et al, 2009; Sansosti & Powell-Snith, 2008; Smith, 2001 |
| Social Stories presented on video tape | O'Connor, 20009; Scattone, 2008 |
| Social Stories presented on audio tape | Kalyva & Agaliotis, 2009 |

**Table 2.9.4: A table providing a summary of the different methods of social story construction and presentation within the reviewed studies**

In line with Kuoch & Mirenda's (2003) assertion, the studies reviewed here differed quite significantly in terms of story construction with just 16 of the 29 stating that stories had been written in adherence with the basic Social Story formulation. Whilst the story composition has not been analysed within this paper, in their empirical review of the literature, Reynhout & Carter (2006) claimed that a number of the stories evaluated deviated significantly from the ration of different sentence types prescribed by Gray (2003). Interestingly, they concluded that there was no evidence that these variations had a negative impact on the effectiveness of the intervention.

A couple of studies have looked to explore this issue further by manipulating Gray's (2004) Social Story sentence ratio (see section 2.6.2). Having compared standard and directive Social Stories, Quirmbach et al (2009) suggested that

directive sentences may be the active ingredient in Social Stories and Reynhout & Carter (2006) uncovered preliminary evidence that the frequency of consequence sentences might impact on efficacy as stories with lower levels of consequence sentences were associated with lower levels of PND (percentage of non overlapping data from baseline to treatment). However, as Reynhout & Carter (2006) explain, this evidence should be treated with caution as data have been obtained from a limited number of stories, variables have not been experimentally manipulated and the percentages of various sentence types varied considerably.

#### 2.9.4.1. Pictures, photographs, symbols and computer and video presentation

Not only was there considerable variation in the use of sentence types, there were also differences in the use of illustrations. This variation reflects Gray's (2004) recommendation that illustrations can take the form of drawings, photographs, objects of PowerPoint™ presentation depending on the child's individual needs.

Eleven of the studies utilised visual symbols, photographs and drawings, whilst 4 studies employed computer-based Social Stories, two used video taped and DVD stories and another used audio recording.

Significantly, only one of the studies within the review compared the effect of Social Story presentation on efficacy finding differential outcomes. In their study, Richmond-Mancil et al (2009) utilised paper format and PowerPoint™ Social Stories and found that results were slightly better for those written on PowerPoint™. They concluded that this might be because they were presented on computers, which are often of high interest to children with ASD, and are therefore likely to aid their attention whilst simultaneously building upon their visual strengths.

### 2.9.5. Story implementation

There were clear differences in the way in which the stories were implemented as can be seen from the summary of the findings in Table 2.9.5.

| | |
|---|---|
| Social Stories read by an adult | Crozier & Tincani, 2007; Kuoch & Mirenda, 2003; Kuttler et al, 1998; Schneider & Goldstein, 2009; Swaggart et al, 1995; Toplis & Hadwin, 2006 |
| Social Stories read by a child | Chan & O'Reilly, 2008; Theimann & Goldstein, 2001 |
| Social Stories watched or listened to | Hagiwara & Myles, 1999; Kalyva & Agaliotis, 2009; O'Connor, 2009; Sansosti & Powell-Snith, 2008; Scattone, 2008; Smith, 2001 |
| Social Stories followed by comprehension questions | Chan & O'Reilly, 2008; Crozier & Tincani, 2007; Delano & Snell, 2006; Reynhout & Carter, 2007; Richmond-Mancil, 2009; Scattone et al, 2002; Schneider & Goldstein, 2009; Whitehead, 2007 |
| Social Stories implemented alongside other strategies | Barry & Burlew, 2004; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Rowe, 1999; Sansosti & Powell- Scattone et al, 2006; Smith, 2008; Swaggart et al, 1995; Theimann & Goldstein, 2001 |

**Table 2.9.5: A table providing a summary of the different methods of social story implementation within the reviewed studies**

#### 2.9.5.1. Story Reading

In 24 of the 29 studies Social Stories were read either by the child or an adult. Of these studies, six reported that the stories were read by the teacher or teaching assistant (Crozier & Tincani, 2007; Kuoch & Mirenda, 2003; Kuttler et al, 1998; Schneider & Goldstein, 2009; Swaggart et al, 1995; Toplis & Hadwin, 2006) whilst two stated that the stories were read by the children (Chan & O'Reilly, 2008; Theimann & Goldstein, 2001) and in one the story was read by the researcher (Bledsoe et al, 2003). In other studies several stories were evaluated, some of which were read by the child and others by an adult (Ozdemir, 2008; Rowe, 1999; Smith, 2001).

In a further six studies the Social Stories were either viewed on a computer / video / DVD (Hagiwara & Myles, 1999; O'Connor, 2009; Sansosti & Powell-Smith, 2008; Scattone, 2008; Smith, 2001) or listened to on an audio tape (Kalyva & Agaliotis, 2009).

Social Stories were found to be effective across these studies. To date there has been no direct comparison of the impact of different methods of implementation on outcomes and as such it is not clear whether this factor is important in the success of Social Story interventions.

#### 2.9.5.2. Comprehension

Gray (1995) highlights the need for authors to take into consideration a child's level of comprehension when writing a Social Story (see section 2.6.2) and in eight of the 29 studies children were asked a set of comprehension questions following implementation of the story (Chan & O'Reilly, 2008; Crozier & Tincani, 2007; Delano & Snell, 2006; Reynhout & Carter, 2007; Richmond-Mancil, 2009; Scattone et al, 2002; Schneider & Goldstein, 2009; Whitehead, 2007).

Significantly, Reynhout and Carter (2006) noted that increased comprehension of the story was associated with an increase in the targeted behaviour, suggesting that the inclusion of comprehension questions may be an important component of a Social Story intervention.

#### 2.9.5.3. Additional strategies

Existing research has been criticised for the fact that other strategies are often implemented alongside Social Stories (Kuoch & Mirenda, 2003) and this was the case in twelve of the studies reviewed here. The intervention was often combined with verbal and/or physical prompting (Barry & Burlew, 2004; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Rowe, 1999; Scattone et al, 2006b; Swaggart et al, 1995). Whilst in other cases the stories were utilised alongside behavioural interventions (Kuttler et al, 1998; Scattone et al, 2006b; Swaggart et al, 1995), visual timetables (Barry & Burlew, 2004; Kuttler et al, 1998), written text cues (Theimann & Goldstein,

2001), video feedback and models (Theimann & Goldstein, 2001; Sansosti & Powell-Smith, 2008).

One paper of note is that of Crozier & Tincani (2007). In their study of three pre-school children, two received Social Stories in isolation whilst the third received the Story and additional verbal prompts. Results demonstrated that when the Social Story was accompanied with prompts, higher levels of the desired target behaviour were achieved.

Such findings highlight the need for further investigation into the effectiveness of Social Stories as a sole intervention and when accompanied by additional strategies.

### 2.9.6. Maintenance, Generalisation & Social Validity

In their review of the literature Reynhout & Carter (2006) are critical of the fact that issues of maintenance and generalisation have been inadequately addressed. The findings of this review suggest that very few studies have evaluated the maintenance or generalisation of the skills acquired through the use of a Social Story and most have also failed to assess the social validity and acceptability of the intervention (Table 2.9.6). This is significant, as maintenance, generalisation and social validity are considered by many to be important measures of an interventions success (Kazdin, 1977; Reynhout & Carter, 2006; Wolf, 1978).

The maintenance of skills learnt from a Social Story is clearly important as the goal is to teach the child new skills and understanding before fading the story out (Gray, 1994). If skills are not maintained then the child is ultimately dependent on the story.

The social acceptance of the intervention would appear to be similarly important as the likelihood of the Social Story intervention being utilised will be influenced by its tolerability.

It is arguable though, whether generalisation is as crucial in relation to Social Story interventions, as they are intended to address a specific area of difficulty or a specific situation (Gray, 2004).

| | |
|---|---|
| Maintenance data reported | Crozier & Tincani, 2007; Kalyva & Agaliotis, 2009; Kuoch & Mirenda, 2003; Ozdemir, 2008; Quirmbach et al, 2009; Sansosti & Powell-Smith, 2006; Schnedier & Goldstein, 2009; Theimann & Goldstein, 2001; Wright, 2009 |
| Generalisation data reported | Abraham, 2009; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Quimbach et al, 2009; Rowe, 1999; Scattone, 2008; Schneider, & Goldstein, 2009; Swaggart et al, 1995, Theimann & Goldstein, 2001 |
| Social Validity data reported | Chan & O'Reilly, 2008; Crozier & Tincani, 2007; Ozdemir, 2008; Richmond-Mancil et al, 2009; Scattone at al, 2002; Smith, 2001; Theimann & Goldstien, 2001; Whitehead, 2007 |

**Table 2.9.6: A table providing a summary of the data obtained for measures of maintenance, generalisation and social validity within the reviewed studies**

### 2.9.6.1. Maintenance

Maintenance data were only reported in nine of the 29 studies. Of those studies, eight suggested that rates of maintenance were high (Crozier & Tincani, 2007; Kalyva & Agaliotis, 2009; Kuoch & Mirenda, 2003; Ozdemir, 2008; Quirmbach et al, 2009; Schnedier & Goldstein, 2009; Wright, 2009), but results were not always consistent across all of the participants.

The Kalyva & Agaliotis (2009) paper reported very positive results for maintenance. Their study looked at the effectiveness of Social Stories to help children with learning difficulties to develop interpersonal conflict resolution skills and they incorporated a follow-up phase. Measurements taken during this phase revealed that children who had received the Social Story intervention selected more appropriate interpersonal conflict resolution strategies during follow-up sessions than those in the control group.

Similarly, Ozdemir (2008) reported that as the intervention faded the three children in her study continued to present with lower levels of disruptive behaviour than they had prior to the implementation of the Social Story.

Conversely, Sansosti & Powell-Smith (2006) found that for all three of the children in their study there was a failure to demonstrate skill maintenance and Theimann & Goldstein (2001) state that their maintenance data was not compelling.

It seems clear from these findings that further research will be necessary to clarify levels of skill maintenance following the fading of a Social Story.

#### 2.9.6.2. Generalisation

Data on generalisation is equally limited and equivocal. Only nine of the 29 studies made reference to the generalisation of skills.

Many of these studies reported limited generalisation of targeted behaviours or newly acquired skills in more than one setting (Abraham, 2009; Hagiwara & Myles, 1999; Kuoch & Mirenda, 2003; Kuttler et al, 1998; O'Connor, 2009; Rowe, 1999; Swaggart et al, 1995, Theimann & Goldstein, 2001).

In her study of a nine year old boy with Asperger's syndrome, Scattone (2008) noted some generalisation treatment effects. However, whilst rates of eye contact, smiling and reciprocal social interactions were higher during the maintenance phase than the baseline phase they remained lower than they had been in the clinic setting.

In contrast, Qiurmbach et al (2009) and Schneider & Goldstein (2009) reported that game play skills and on-task behaviours were generalised to other settings and Abraham (2009) found that there was greater behaviour change for participants when generalisation had been specifically programmed for within the Social Story.

### 2.9.6.3. Social Validity

Whilst teachers, parents and children were often involved in the development and implementation of the stories, on completion of the intervention, only ten of the studies involved participants in an evaluation. All of these studies concluded that those involved considered the intervention to have been worthwhile and effective.

In two of the papers evaluations were conducted by means of semi-structured interviews (Crozier & Tincani, 2006; Whitehead, 2007). Whitehead (2007) reported that the children who received the Social Stories reacted positively to spending time reading the books although two out of the eight children in this study felt that the intervention was time-consuming.

Five other studies used scales that were designed to specifically assess the social validity of the intervention (Crozier & Tincani, 2007; Ozdemir, 2008; Richmond-Mancil et al, 2009; Scattone at al, 2002; Theimann & Goldstien, 2001). The Intervention Rating Profile (IRP-15) was used to assess teacher acceptability of the intervention in 2 studies (Ozdemir, 2008; Scattone at al, 2002). Scores on this profile can range from 15-90 with higher scores indicating a greater acceptance level and scores above 52.20 considered to be acceptable (Von Brock & Elliot, 1987). The scores obtained in these studies ranged from 68-88 with a mean score of 78 indicating that the Social Story intervention was accepted by teachers and was easily integrated into general classroom routines (Ozdemir, 2008).

The remaining papers utilised Likert-type rating scales (Likert, 1932). In Chan & O'Reilly's (2008) study teachers were asked to rate the stories in terms of the importance of the skills taught, perceived effectiveness, appropriateness and future use on a scale that ranged from 1 (negative) to 5 (positive). The mean rating was 4.3. Smith (2001) gave out an evaluation questionnaire to her participants asking them to rate how successful the intervention had been in producing more appropriate behaviour. Her Likert-type rating scale ranged from 0 (not at all) to 10 (completely) and results indicated that 16 out of the 19 stories

were rated above the mid-point of the scale, while 13 of the 19 achieved a rating between 7 and 10.

These findings suggest that children and teaching staff feel that the Social Story intervention itself is one which is easy to implement and effective. However, findings are limited by issues of respondent bias as participants might have been inclined to give the answer that they perceive the researcher wants to hear (Robson, 2002). Furthermore, as only a small number of studies have sought to evaluate the Social Validity of the approach, further research in this area will be necessary if we are to be able to generalise from these results.

### 2.9.7. Study Design

The final key theme that emerges from the review of the research literature is that of methodology and study design. There are examples of numerous different designs (see Table 2.9.7) and the adoption of each of these has a significant influence on the nature, validity and reliability of the data obtained.

| | | |
|---|---|---|
| Single Case Experimental Designs | AB | Swaggart et al, 1995; Reynhout & Carter, 2007 |
| | ABA (ACBA) | Kuoch & Mirenda, 2003 |
| | ABAB (ABCACBC, ABABCBC) | Bledsoe et al, 2003; Crozier & Tincani, 2007; Ivey et al, 2004; Kuttler et al, 1998, Richmond Mancil, 2009; Toplis & Hadwin, 2006 |
| | Multiple-Baseline-Across-Settings | Hagiwara & Myles, 1999 |
| | Multiple-Baseline-Across-Behaviours | Chan & O'Reilly, 2008; Scattone, 2008; Theimann & Goildstein, 2001 |
| | Multiple-Baseline-Across-Participants | Abraham, 2009; Barry & Burlew, 2004; Bledsoe et al, 2003; Delano & Snell, 2006; Ozdemir, 2008; Sansosti & Powell-Smith, 2006; Sansosti & Powell-Smith, 2008; Scattone et al, 2006; Scattone et al, 2002; Schneider & Goldstein, 2009; Wright, 2009 |
| Case Studies | O'Connor, 2009; Rowe, 1999; Smith, 2001; Whitehead, 2007 | |
| Randomised Controlled Trials | Scattone, 2008 | |

**Table 2.9.7: A table providing a summary of the different designs adopted in he reviewed studies**

### 2.9.7.1 Single Case Experiments

The vast majority of the studies (23 out of the 29) were examples of single case experiments (SCEDs). This is perhaps unsurprising, as proponents of the approach would argue that where the individual's behaviour is the focus of study it is necessary to search for sources of variability in the individual (Barlow, Nock & Hersen, 2009).It is however a significant finding as it provides further evidence of the growing popularity of SCEDs as an alternative experimental technique for analysing the behaviour of individuals in real-world contexts such as schools (Neuman & McCormick, 2002). It is also of considerable professional relevance as these designs are often recommended to practitioners as an effective way of combining research with everyday practice (Ali & Frederickson, 2006).

SCEDs are characterised by the continuous measurement of an individual's behaviour over time throughout separate experimental phases (before, during and after the intervention). Such designs enable a researcher to consider cause-and-effect relationships and therefore draw inferences about the effectiveness of interventions (Cohen, Manion & Morrison, 2007). Continuous measurement ensures participants act as their own controls, promoting high levels of internal validity (Robson, 2002) although, levels of external validity are considered to be low as it is difficult to generalise from the findings of a single case to a wider population (Reyhnout & Carter, 2006) without replicating the experiment with multiple participants (Tawney & Gast, 1984).

A variety of different SCEDs exist and examples of each can be found within the studies included in this review.

Two of the studies utilised the simplest AB (including an ABC variant) design. These designs provide measures of the frequency of specific behaviours during an initial baseline phase (A) prior to the introduction of the story and during subsequent intervention phases when the Social Stories are implemented (B and C). Any change in the frequency of the behaviour from the original baseline rate is noted and subsequently attributed to the intervention. Whilst the AB design is considered to be of some utility (Barlow et al, 2009) several

commentators assert that there are limitations to the conclusions that can be drawn as researchers cannot be certain whether the intervention is responsible for any change or whether changes are the result of other coincidental factors (Barlow & Hersen, 1973; Kazdin, 1982; Kratochwill, 1978; Robson, 2002).

The more complex ABA (including an ACBA variant) design, in which measures of behaviour are recorded during an initial baseline phase (A), intervention phases (B & C) and a return to baseline phase (A), was adopted in one of the studies. This design is believed to provide stronger evidence for a causal relationship than AB designs due to the return to baseline condition (Robson, 2002). Such designs also offer a mechanism for assessing the maintenance of the skills learned by identifying the lingering impact of the effects of a treatment phase on the subsequent withdrawal phase, known as carryover effects (Barlow et al, 2009). It could be argued that this is of particular importance when evaluating the effectiveness of Social Stories, an intervention which is aimed at helping individuals to understand social situations and change specific targeted behaviours by teaching skills that are maintained following fading and withdrawal of the story (Gray, 1994) (see Section 2.6.3). In these ways, ABA designs are considered to be appropriate from an experimental standpoint. Opponents point out however, that they are less desirable from an ethical standpoint as they end on a baseline phase (A) having withdrawn a potentially effective intervention.

A further six studies utilised ABAB designs (including ABCACBC & ABABCBC variants). In ABAB designs, measures of behaviour are recorded during an initial baseline phase (A), intervention phases (B & C), a return to baseline phase (A) and finally a return to intervention phases (B & C). These designs are often favoured as they increase the confidence of the inferences made about the relationship between the intervention and observed behaviour changes whilst avoiding the ethical issues associated with finishing with a return to baseline (Barlow et al, 2009; Robson, 2002). In spite of these benefits, the researcher would argue that the reversal nature of the designs could also be considered as a limitation when evaluating Social Stories. This is a concern shared by Crozier and Tincani (2007) who suggested that the necessity to

withdraw and implement the intervention on two separate occasions within a set period of time meant that it was possible that the children were not exposed to the stories for long enough to benefit from the intervention.

The remaining 14 studies utilised multiple-baseline designs which involve the application of the intervention at different points in time to different baseline conditions (Robson, 2002). In this way, if changes are evident in the specific condition to which the intervention has been applied and not to others, the researcher can argue for a cause and effect relationship. The researcher can adopt one of three different multiple-baseline designs: across-settings; across behaviours; and across participants (Robson, 2002).

The multiple-baseline-across-settings design involves the recording of the target behaviour in different settings with the Social Story being applied to each setting at a different time providing an opportunity to assess the generalisation of skills. In some respects, this design would seem to be at odds with the suggestion that the aim of a Social Story is to develop an individual's understanding of a particular social situation (see section 2.6.1). In spite of this, Hagiwara & Myles (1999) reported an increase in appropriate behaviours for all participants across different settings.

The multiple-baseline-across behaviours design targets several behaviours simultaneously and was adopted in three of the studies. In each case, multiple stories were introduced on a staggered basis to target different social behaviours. The intervention proved to be effective in each of these studies but Scattone (2008) reported that success was dependent on the behaviour being targeted. In particular, she found the story to be most effective for the first of the targeted behaviours. These findings are of interest when considered in the light of Gray's (1994) recommendation that only one story should be introduced at a time in order to avoid overwhelming the child (see Section 2.6.3).

Finally, the multiple-baseline-across-participants design that was adopted by ten of the studies, involves the implementation of the Social Story at different times to different participants. Again, the intervention proved to be effective in

each of these studies but Abraham (2009), Sansosti & Powell-Smith (2006), Scattone et al (2006) and Wright (2009) reported that success was dependent on the participant who was in receipt of the story.

These multiple-baseline designs reduce the confounding variables that are associated with AB designs, the ethical issues involved with ABA designs and the difficulty in assessing for skills maintenance associated with ABA and ABAB designs. Additionally, in gathering data from multiple settings, behaviours and participants it is possible to overcome the aforementioned limitation of low levels of external validity commonly associated with SCEDs. That is not though to say that such designs are infallible as it is possible that some settings, behaviours and participants are interdependent and that changes to one might lead to changes in the others.

#### 2.9.7.2. Case Studies

Four of the studies reviewed were examples of case studies. These included three individual case studies (O'Connor, 2009; Rowe, 1999; Whitehead, 2007) and a group case study (Smith, 2001).

A case study is an approach to research that focuses on a specific individual case e.g. a person, a group or a setting. It will often involve the collection of data from multiple sources which can be both quantitative and qualitative in nature (Robson, 2002). In this way, case studies may appear to present a suitable approach for evaluating the effectiveness of Social Stories and many assert that they represent an appropriate strategy for carrying out empirical investigations in real world-settings (Yin, 1994). However, the researcher would argue that any attempts to generalise from the findings of these case studies to other contexts must be made with caution. Whilst the use of multiple measures of data collection before, during and after the intervention in Rowe's (1999) study and the reporting of multiple cases within Smith's (2001) help to increase the validity of the findings, issues remain.

In Smith's (2001) study, the staff participating in the research were volunteers. As such it would be difficult to generalise to other contexts in which staff might

have been asked to write and implement Social Stories and may be less enthusiastic about the approach. Furthermore, the use of self report observation schedules and questionnaires along with the administration of interviews to individuals who were involved in the writing, development and implementation of the Social Stories, raise issues of researcher and respondent bias.

#### 2.9.7.3. Randomised controlled trials

Just two of the studies included in the review represented randomised controlled trials (RCTs) (Kalyva & Agaliotis, 2009; Quirmbach et al, 2009) with both concluding that social stories were an effective intervention.

RCT designs are believed to offer the most effective method for balancing confounding factors between groups and thus providing evidence for the efficacy of interventions (Robson, 2002). Additionally, the Quirmbach et al (2009) study is the largest scale investigation into the effectiveness of Social Stories that has been conducted to date. With this in mind, it seems reasonable to conclude that the results obtained from these studies demonstrate that Social Stories constitute a robust and effective intervention for developing social competencies (Kalyva & Agaliotis, 2009).

However, as with the previous studies there are a number of limitations. Firstly, only one Social Story was used in Kalyva & Agaliotis's (2009) study for all 31 of the children in the experimental group and as such the intervention was not individualised as is recommended by Gray (1995). Secondly, the use of hypothetical interpersonal conflict scenarios means that it is impossible to generalise the results of the study to real-life situations. Lastly, this was an open trial and as such there is the potential for bias in the teacher's ratings of the children's social behaviour as they were aware of the aims of the study.

In the Quirmbach et al (2009) study, the play sessions were unnatural, taking place outside of the classroom with adult play partners and consequently it is not possible to generalise from the results obtained here to more familiar settings with peers. Additionally, although, researchers worked hard to obtain

measures of maintenance, only one observation was taken just a week after the intervention.

The presence of just two RCT designs within the literature illustrates the difficulty of setting up such studies to evaluate the effectiveness of interventions such as Social Stories in real world contexts. Such trials require large groups of participants and as such are expensive and time consuming. Furthermore, researchers are required to withhold the intervention from participants who have been allocated to the control group generating ethical issues.

## 2.10. Summary of Literature Review

What is immediately clear from an analysis of the research literature is that all of the studies within this review conclude that Social Stories can be effective in addressing the needs of children and young people on the Autism Spectrum. Additionally, several studies indicate that Social Stories may also be effective in meeting the needs of children who do not have a diagnosis of ASD but who present with social, emotional, behavioural and learning needs.

Importantly, those studies that have sought to gain the opinions of the children, teachers and parents have also reported that the intervention is readily accepted and deemed to be worthwhile by those involved.

However, in spite of these positive outcomes, there remain a number of unanswered questions that at present prevent Educational Psychologists and other support service professionals from recommending Social Stories unreservedly.

The aforementioned methodological limitations bring into question the credibility of many of the findings. The vast majority of the studies were examples of either SCEDs or case studies and consequently external validity is limited. Whilst acknowledging this limitation, it should be noted that as there is an emphasis on experimental control and the continuous measurement of responses over time,

SCEDs have strong internal validity. Furthermore, when conducted with multiple participants external validity is increased. The presence of two RCTs (Kalyva & Agaliotis, 2009; Quirmbach et al, 2009) provides additional evidence for the efficacy of the intervention by balancing the confounding variables between groups, although the findings of these studies are limited by their unnatural experimental settings.

Aside from the study design, future research will also need to address a number of other key issues.

Firstly, it is not yet clear for which children Social Stories are likely to be most effective. While Gray & Garand (1993) state that they are most likely to benefit students who are 'intellectually trainable' and have basic language skills, this assertion has not been verified by research. The studies in this review reported on the use of Social Stories with children who had a wide variety of needs and skills e.g. children with diagnoses of ASD, children with social emotional and social difficulties, children with learning difficulties, children with below average communication skills and children with little or no language at all. Whilst results suggest that Social Stories have been effective in addressing the social behaviours of the majority of children, a couple of interesting findings have emerged. From the studies analysed in this review Social Stories appear to be less effective for children with poor receptive language where comprehension of the stories is limited (Crozier & Tincani, 2007; Reynhout & Carter, 2007); and to be most effective for those children who have poorly developed social skills and difficulties with perspective taking (Toplis & Hadwin, 2006; Whitehead, 2007). However, limited descriptions of the children's abilities mean that, as yet, it is not possible to draw up an accurate profile of the children for whom Social Stories are likely to be most beneficial. To date, none of the studies have compared the effect of Social Stories on supporting children who present with different needs and have differing diagnoses.

Secondly, Gray (2003) claims that Social Stories can be used to address a variety of applications. As Reynhout & Carter (2006) noted, whilst the studies that have been conducted to date have targeted a range of different behaviours,

none of them reported on the effectiveness of curriculum related Social Stories (Gray & Garand, 1993). Consequently, the effectiveness of the intervention for teaching academic skills is yet to be addressed (Reynhout & Carter, 2006).

Significantly, as highlighted by Ali & Frederickson (2006) and Reynhout & Carter (2006) it is important that future studies examine the critical components of Social Stories and their implementation. At present the majority of studies aim to utilise Social Stories that adhere to Gray's (2000) 'basic social story ratio' however, Reynhout & Carter (2006) have concluded that there is "no evidence" that a failure to do so impacts on the effectiveness of the intervention. Future research should aim to investigate whether this 'ratio' is crucial to story design. Similarly, despite Gray's (2003) recent claim that the use of personalised pictures may be beneficial to social understanding, studies have failed to systematically examine their effectiveness.

With regards to the implementation of the stories, questions remain as to whether they are most effective when they are read to or read by the child. As many studies now employ computer-presented Social Stories, it might also be helpful to consider how utilising such technology impacts on the efficacy of the intervention.

A number of the studies included in this review combined Social Stories with additional interventions. In additional prompting, behavioural strategies, visual timetables and video feedback have been utilised, it is difficult to determine which of the interventions has been responsible for the improvements in social behaviour. The employment of more rigorous controls would enable clearer conclusions to be reached.

It will also be important for researchers to investigate the generalisation and long term maintenance of skills following a Social Story intervention. At present, few studies have reported on maintenance and generalisation, issues that are fundamental to the effectiveness of the intervention for children with ASD (Reynhout & Carter, 2006).

## 2.11. Conclusion to Literature Review

In conclusion, I would concur with the views of Ali & Frederickson (2006) in suggesting that the current literature base indicates that Social Story interventions have considerable potential. By addressing the aforementioned gaps in the literature on the effectiveness of Social Stories it should be possible for EPs, support professionals, teachers, teaching assistants and parents to utilise the intervention for children and young people on the Autism Spectrum with greater confidence in the future.

## 2.12. The Potential Contribution of this Study

This research project aims to address a number of the aforementioned issues.

Firstly the researcher aims to investigate the effectiveness of Social Stories for addressing specific target behaviours of children with a diagnosis of ASD in primary school settings. In this way it is hoped that the study will contribute to the existing literature and evidence base that points to the promise of the intervention (Ali & Frederickson, 2006).

Secondly, the study will attempt to assess the maintenance of skills acquired from the stories. To date, such assessments have only been conducted in nine of the studies, and as was explained in section 2.9.5.4., have produced equivocal results.

Finally, the study will examine the importance of visual cues in Social Stories to enhance social understanding (Gray, 2003). As research has identified that individuals with ASD often have proficiencies in the areas of visual-perception (Lincoln, Courchesne, Kilman, Elmasian & Allen, 1988) and benefit from the support of visual cues such as pictures (Kistner et al, 1988; Krantz & McClannahan, 1993) it would seem likely that Social Story interventions could be enhanced by incorporating a range of visual strategies (Scattone, 2008).

In spite of this understanding, only eleven of the studies stated that they utilised Social Stories with visual symbols, photographs and drawings, whilst 4 studies employed computer-based Social Stories and two used videos and DVDs. Significantly, only one of the studies within the review compared the effect of Social Story presentation finding that outcomes were slightly better for the children who received Social Stories in PowerPoint™ rather than in paper format (Richmond-Mancil et al, 2009). The authors concluded that this might be because they were presented on computers which are often of high interest to children with ASD. Furthermore, this format enabled the use of visual prompts such as photographs of peers which the authors believe may have helped to maintain the child's attention (Richmond-Mancil et al, 2009).

These assertions, alongside evidence that suggests children with ASD have strong visual skills, (Quirmbach et al, 2009) seem to support the use of visual cues and illustrations as key components of Social Stories. As yet though, there has been no consideration of the types of illustrations that may be most beneficial in supporting the child's understanding. Studies regularly incorporate a range of photographs, symbols and children's drawings and at present, Gray's (2004) guidelines only suggest that Social Stories "may include individually tailored illustrations" falling short of providing any guidance on the nature of the images. This would seem to imply that all forms of illustration will be equally effective however the research cited in section 2.6.3. by Allen (2009) would indicate that the choice of illustration should be determined by an understanding of the way children with ASD comprehend pictures. With this in mind, the researcher will explore the effectiveness of Social Stories utilising photograph illustrations which will involve the child and symbol illustrations that will comprise clipart pictures chosen by the author of the stories.

Having outlined the contribution this study aims to make to the existing evidence base on Social Stories, the following research questions have been developed:

### 2.12.1. Research Questions

1. Are Social Stories an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD?

2. Are Social Stories with photograph illustrations effective for addressing the target behaviours of primary aged children with a diagnosis of an ASD?

3. Are Social Stories with symbol illustrations effective for addressing the target behaviour of primary aged children with a diagnosis of an ASD?

In order to determine whether the Social Story intervention and the manipulation of the illustrations are responsible for any changes in behaviour, it will be necessary to generate a number of hypotheses. These have been drawn from the research questions and have been outlined in 2.12.2.

### 2.12.2. Experimental Hypotheses

1. **Experimental Hypothesis:** Social Stories will be an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD.
   **Null Hypothesis:** Social Stories will not be an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD.

2. **Experimental Hypothesis:** Social Stories with photograph illustrations will be an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD.
   **Null Hypothesis:** Social Stories with photograph illustrations will not be an effective intervention for addressing the target behaviours of children with a diagnosis of ASD.

3. **Experimental Hypothesis:** Social Stories with symbol illustrations will be an effective intervention for addressing the target behaviours of children with a diagnosis of ASD.
   **Null Hypothesis:** Social Stories with symbol illustrations will not be an effective intervention for addressing the target behaviours of children with a diagnosis of ASD.

# CHAPTER 3: METHODOLOGY

## 3.1. Introduction to Methodology

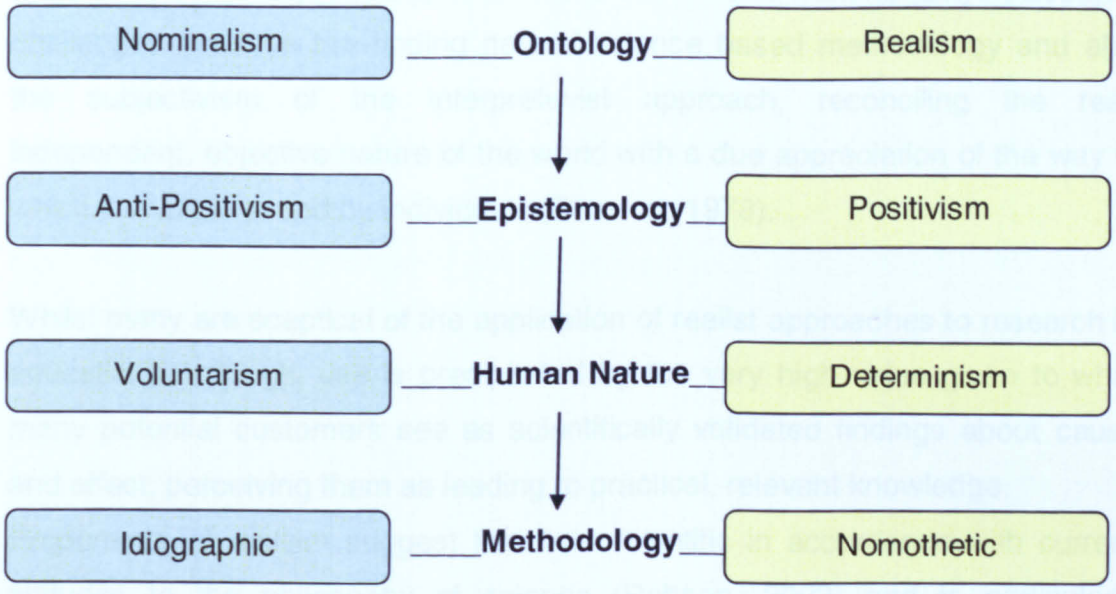
This chapter describes the methodology. It provides an explanation of the research philosophy, a description and justification of the chosen method and a detailed account of the study design and procedures. The chapter concludes with an exploration of issues of validity, reliability and ethics.

## 3.2. Ontology, Epistemology & Methodology

The term ontology refers to the philosophical study of the nature of being, existence and reality, whilst epistemology is the term used to describe what we know about reality and its relationship to knowledge (Cohen, Manion & Morrrison, 2007).

The ontological and epistemological assumptions that a researcher brings to the research process inform their methodological considerations which in turn determines issues of instrumentation and data collection (Hitchcock & Hughes, 1995). As such, having an understanding of the relationship between the view one holds of reality and the meaning ascribed to knowledge and creation is fundamental in determining the rationale for research design and methodology (Darlaston-Jones, 2007).

Burrell & Morgan (1979) have identified four sets of assumptions which guide a researcher's thinking when undertaking investigations in the social world. These have been summarised in the flowchart in Figure 3.3.1.




(Adapted from Cohen et al, 2007, page 9 )

**Figure 3.2.1: A flowchart outlining the assumptions about the nature of social science**

### 3.2.1. Ontology

As illustrated in Figure 3.2.1, at the outset, researchers' ontological assumptions about the nature of the social phenomenon that is being investigated will be drawn from the stance they adopt within the nominalist-realist debate. Nominalists hold the view that abstract concepts, general terms or universals have no independent existence but exist only as names. Alternatively, realists assert that universal objects exist independently of them being perceived (Cohen et al. 2007).

The current study evolved from realist ontology which contends that universal truths exist but recognises that none of these 'facts' are beyond dispute as knowledge is a social and historical product. In this way, 'facts' are considered to be theory laden and can only be understood in the context in which they exist (Robson, 2002). Table 3.2.2 provides an outline of the realist view of science.

Realism offers promise for social science and theory since it provides an alternative to the philosophical and methodological positions of positivism and

anti-positivism (interpretivism) which have been found wanting (Sayer, 2000). It challenges both the law-finding natural science based methodology and also the subjectivism of the interpretevist approach, reconciling the real, independent, objective nature of the world with a due appreciation of the way in which it is experienced by individuals (Bhaskar, 1978).

Whilst many are sceptical of the application of realist approaches to research in educational settings, use is precipitated by the very high value given to what many potential customers see as scientifically validated findings about cause and effect, perceiving them as leading to practical, relevant knowledge.
Proponents of realism suggest that it is scientific in accordance with current attitudes to the philosophy of science (Robson, 2002) and is particularly appropriate for research in practice and value based professions (Anastas, 1998) including psychology (Fletcher, 1996; Manicas & Secord, 1983; Shames, 1990).

The current study takes the form of applied research, often referred to as 'real world research', in reference to the fact that it is conducted within the context in which whatever we are studying occurs e.g. community and school settings (Robson, 2002). In such settings, the kind of deliberate and active control that can be obtained within a laboratory setting is neither feasible nor ethically justifiable. Furthermore there are often strict time and cost constraints.

The researcher would contend that 'real world research' sits comfortably within realist ontology as it acknowledges the complexity of the real world and aims to explain how events occur in particular situations. Search research "can be thought of as some kind of evaluation: an attempt to assess the worth or value of some innovation, intervention, service or approach" (Robson, 2002, page 202).

Evaluation is considered to be open ended research that contributes something original to the field and extends the frontiers of knowledge and theory (Cohen et al, 2007; Robson et al, 2002). In this way, evaluative research aims to contribute to an evidence base that professionals can draw upon to inform

assessments, interventions and policies. It also promotes best practice and ensures professional accountability (Stoiber & Kratochwill, 2000).

Without conducting systematic research in educational settings it is not possible to determine the appropriateness of school based interventions. Frederickson (2002) asserts that Educational Psychologists should therefore be both users of research and researchers in their own right, combining their professional expertise with the best available research evidence.

Having considered the various approaches, realism appeared to offer the most appropriate philosophical standpoint from which to approach this research project in a real world setting. As such an evaluative study was designed to accommodate the needs of both the National Collaborative Research Project and the Local Authority within which the research was being conducted.

1. There is no unquestionable foundation for science, no 'facts' that are beyond dispute. Knowledge is a social and historical product. 'Facts' are theory laden.

2. The task of science is to invent theories to explain the real world, and to test theories by rational criteria.

3. Explanation is concerned with how mechanisms produce events. The guiding metaphors are structures and mechanisms in reality rather than phenomena and events.

4. A law is the characteristic pattern of activity or tendency of a mechanism. Laws are statements. About the things that are 'really' happening, the ongoing ways of acting of independently existing things, which may not be expressed at the level of events.

5. The real world is not only very complex but also stratified into different layers. Social reality incorporates individual, group and institutional, and societal levels.

6. The conception of causation is one in which entities act as a function of their basic structure.

7. Explanation is showing how some event has occurred in a particular case, events are to be explained even when they cannot be predicted.

(Taken from Robson, 2002, page 32)

**Table 3.2.2: A table outlining the realist view of science**

### 3.2.2. Epistemology

Epistemological assumptions about how knowledge can be acquired exist along a continuum on which there are the poles of Positivism and Anti-Positivism also often referred to as Interpretivism or Constructivism. From a positivist standpoint knowledge is conceived of as hard, objective and tangible whereas an anti-positivist sees knowledge as personal, subjective and unique (Cohen et al, 2007).

A realist view falls between a positivist and anti-positivist (interpretivist/constructivist) epistemology and is an attractive choice for social researchers wishing to characterise what they are doing as scientific (Robson, 2002).

A positivist views knowledge as objective facts that can be scientifically tested and observed to identify the existence of universal causal laws (Robson, 2002). Whilst positivism is still embraced by many as the 'standard view' of science and the approach that provides us with the clearest possible ideal of knowledge, it is less successful when applied to the study of human behaviour due to the complexities of human nature and social phenomena, factors which are strikingly apparent in school contexts (Cohen et al, 2007).

At the other extreme, anti-positivists (interpretivists / constructivists) view knowledge as subjective, something that is personally experienced and interpreted, multi-layered and complex (Cohen et al, 2007). They are often criticised for having given up hope of discovering any useful generalisations about behaviour (Cohen et al, 2007).

A post-positivist recognises the limitations and criticisms of a positivist approach without rejecting the basic assumptions of ontological realism, the possibility of an objective truth and the use of experimental methodology (Robson, 2002). As a consequence, such an approach embraces the measurement of the objective effectiveness of an intervention whilst recognising the need to examine the perceptions of participants and appears to offer the most appropriate epistemological position from which to investigate Social Story efficacy.

### 3.2.3. Human Nature

The third set of assumptions identified by Burrell & Morgan (1979) concern the relationship between human beings and their environment. Determinism proposes a view of humans as responding in a pre-determined way to their environment while voluntarism views humans as the initiators of their own actions.

The latter viewpoint is consistent with a realist approach to scientific enquiry which proposes that the conception of causation is one in which entities act as a function of their basic structure (Robson, 2002). However realist ontology also promotes an exploration of the different layers that comprise the 'real world' and emphasises the importance of the social reality of the context which incorporates individual, group and institutional levels (Robson, 2002).

### 3.2.4 Methodology

Figure 3.2.1 shows how each of these assumptions (Burrell & Morgan, 1979) are influential in determining the design and methodology of a research study. As Cohen et al (2007) indicate, where a researcher subscribes to a view of the social world as fixed and objective, any investigation will be aimed at exploring and analysing the relationships between the factors within it. Such a study would adopt a nomothetic approach and be predominantly quantitative, concerned with identifying and defining elements, discovering ways in which their relationships can be expressed and searching for universal laws (Cohen et al, 2007). Alternatively, where a researcher favours a view of social reality which stresses the importance of the subjective experience of individuals in the creation of the social world, their approach would be idiographic, being both qualitative and quantitative, and focused on gaining an understanding of the particular case rather than the universal (Cohen et al, 2007).

A realist philosophy and a post-positivist epistemology support the use of the quantitative methods of data collection associated with positivism and the qualitative methods that are typical of anti-positivism (Thistleton, 2008).

The approach supports the use of observations and 'triangulation' of methods in which researchers look for agreement among multiple and different sources of information (Creswell & Miller, 2000) in the hope of reducing the effect of investigative error and increasing our understanding of reality (Bhaskar, 1978). In this way, a realist approach is highly compatible with 'real world' enquiry which is often characterised by the use of mixed methods (Robson, 2002).

Whilst Sale, Lohfield & Brazil (2002) state that by mixing methods we can devalue the potential of both of them, Johnson & Onwuegbuzie (2004) suggest they provide an opportunity to maximise the strengths and minimise the weaknesses of quantitative and qualitative paradigms and that mixed methodologies should therefore be considered as a third paradigm. Furthermore, Neuman & McCormick (2002) suggest that with the growing desire for evidence based practice, reliance on one form of research methodology over another may yield insufficient data.

By conducting a quantitative and qualitative analysis yielding both numeric and textual data it should be possible to obtain an objective measure of the effectiveness of the Social Story intervention and gain a deeper understanding of the characteristics of successful Social Story interventions by examining participant's perceptions.

## 3.3. Method

### 3.3.1. Study Design

#### 3.3.1.1. Single Case Experiments

Multiple single case experiments were conducted to evaluate the effectiveness of the Social Stories for individual participants.

A single case experimental design (SCED) was selected for this study as it has been proven to be particularly relevant for evaluating educational practices at the level of the individual (Horner, Carr, Halle, McGee, Odom, Wolery, 2005). Such designs are also the methodology of choice for the majority of studies that have been undertaken to date exploring the effectiveness of Social Stories (see section 2.9.7.1).

SCED studies have evolved from the work of Skinner (1938) who sought to develop a methodology capable of producing reliable data at the level of the individual. As discussed in Section 2.0.7.1, SCEDs involve the researcher taking repeated measures of an individual's behaviour across the course of separate experimental phases (commonly before, during and after the intervention) (Robson, 2002). In this way, they offer a mechanism for exploring cause-and-effect relationships and drawing inferences, within certain parameters, about the effectiveness of interventions (Cohen et al, 2007) without the need for conducting large and expensive group studies and carrying out statistical significance testing (Neuman & McCormick, 2000).

Within SCEDs, interventions that are aimed at addressing the needs of individuals can be systematically analysed (Dunlap & Kern, 1997) with a level of experimental rigour beyond that which is found in traditional case studies (Shavelson & Towne, 2002). They provide a structure within which the behaviour of one subject or a number of subjects can be studied intensively, providing the researcher with an opportunity to investigate changes and sources

of variability at an individual level as opposed to averaging the behaviours of several subjects within an experimental and control group.

For these reasons, SCED approaches have grown in popularity and over 45 professional journals are now reporting such studies (American Psychological Association, 2002; Anderson, 2001). These findings reveal that SCEDs are utilised frequently by researchers working within the field of education who are keen to examine the effectiveness of educational interventions that can be used to develop personalised educational and support plans (Horner et al, 2005). As such, they would seem to provide the most appropriate method for investigating the effectiveness of Social Stories within this study.

As Barlow, Nock & Hersen, (2009) point out however, the search for individual variability within SCED approaches appears to run contrary to the scientific aim of establishing the generality of findings. It is this issue of generalisation that is cited as the most apparent limitation of SCEDs with critics arguing that even if you can isolate the variable that is responsible for the behaviour change in a given individual through rigorous experimental design, there is little basis for inferring the same variable would be equally effective when applied to different individuals, by different researchers and in different settings (Barlow et al, 2009). This constraint and other issues relating to the strengths and limitations of the study design will be considered in greater detail in Section 3.4.1.

#### 3.3.1.2. ABA Design

As discussed earlier (section 2.9.7.1), there are numerous designs available to a single case experimental researcher. Consequently, it is possible to select the design that is most appropriate for exploring the causal or functional relationships between the chosen intervention and the behaviour of the individual within the specific 'real world' parameters and context of a study.

An AB design, in which measures of the frequency of specific behaviours are recorded during an initial baseline phase (A) prior to the introduction of the story and during a subsequent intervention phase when the Social Story is implemented (B) was dismissed on the basis of some 'major reservations'

(Barlow et al, 2009). These reservations centre on the claim that any changes in the frequency of the behaviour from the original baseline cannot reliably be attributed to the intervention. As Wolf & Risley (1971) indicate, such an analysis fails to consider any spontaneous changes in behaviour which may have occurred even if we had not intervened.

The best known SCED is the ABAB design (Barlow et al, 2009) in which measures of behaviour are recorded during an initial baseline phase (A), intervention phases (B), a return to baseline phase (A) and finally a return to intervention phases (B). As a consequence of these additional phases, this design provides two occasions for demonstrating the effects of the treatment strengthening the conclusions that can be drawn (Barlow & Hersen, 1973). Unfortunately such a design also requires additional time (Robson 2002) and as the timescale for this project was the 6 weeks of a school half term, it would not have been possible to have completed a fourth phase.

In order to overcome some of the aforementioned difficulties, a researcher may adopt a multiple baseline in which the intervention is applied at different points in time to different baseline conditions: across-behaviours; across-settings; and across participants. In applying the intervention in this way, if changes are evident in the specific condition to which the intervention has been applied and not to others, the researcher can be more confident in arguing for cause-and-effect relationships (Robson, 2002). Despite these strengths, across-behaviours and across-settings designs were deemed to be inappropriate for evaluating Social Stories as they are designed to address specific behaviours in specific situations. Had an across-participants design been adopted it would have been necessary for the Social Stories to have been introduced and withdrawn randomly at different times to different participants. Whilst such a design would have permitted the use of randomisation tests when undertaking analysis of the data (Todman & Dugard, 2001), it would, like the ABAB design, have necessitated that the study continued over a school half term holiday and this was not possible (see Section 4.3.2. for a more thorough exploration of data analysis issues).

Having considered all of the options, the current study utilised an ABA design. Such designs measure the frequency of a participant's target behaviour prior to the implementation of the Social Story during an initial Baseline Phase (A); whilst the intervention is being implemented during the Intervention Phase (B); and after the intervention has been withdrawn during reversal to the baseline condition (A) (Barlow et al, 2009).

The addition of this reversal phase (second 'A' phase) to the simpler AB design is considered to offer benefits to the researcher (Barlow et al, 2009; Robson, 2002) as it provides an opportunity for the analysis of the effects of the introduction and subsequent removal of an intervention. If, following the initial baseline phase (A), the introduction coincides with an improvement in the participant's behaviour (B) and the removal (A) with a deterioration, then the researcher can conclude with greater certainty that the intervention is responsible for the changes (Barlow et al, 2009). Furthermore, such designs can also be employed to assess the maintenance of learning from the social stories (Robson, 2002). In this instance maintenance would be represented by the occurrence of 'carryover effects' (Barlow et al, 2009) during the final (A) phase.

Whilst an ABA design is believed to be more experimentally robust than its AB counterpart, it is open to ethical objections as it ends on a Baseline phase, following the withdrawal of a potentially beneficial intervention (Barlow et al, 2009). The researcher attempted to overcome this issue by ensuring that the Social Story could remain in school on completion of the project, allowing the child to continue to access it if it had proven to be beneficial.

A visual representation of the chosen ABA design has been provided in Figure 3.3.1.

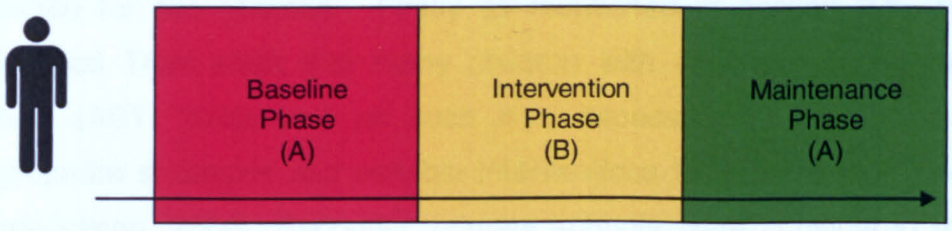



**Figure 3.3.1: A visual representation of the Single Case Experimental Design**

By replicating the single case experiment with multiple participants the researcher hoped to increase the external validity of the findings (Tawney & Gast, 1984) thus addressing the aforementioned key limitation of SCED studies.

### 3.3.2. Participants

There were 10 children participating in this study, all of whom had a diagnosis of ASD. The participants attended one of 8 different mainstream primary schools located within the same West Midlands Local Authority and were all listed on the SEN register. The children ranged in age from 5 -11. Two of the children were in Key Stage 1 classes (Year 1) and six were in Key Stage 2 (Years 3, 4, 5 & 6). All of the children were boys and all of them had a teaching assistant who had been designated to them to support their special educational needs. See Table 3.3.2 for individual participant details.

#### 3.3.2.1. Sampling

Participants were selected from a sampling frame which was designed to be both representative of the population under investigation and practically achievable, in that they were children with whom the Educational Psychologist would have been working with as part of their professional practice.

The sample frame included all of the children with a diagnosis of ASD who attended mainstream primary schools within the local authority and letters outlining the nature of the project along with consent forms were distributed to these schools at the beginning of the autumn term (see Appendix C for a copy of the covering letter and the consent form). Mainstream primary schools were

selected for two reasons. Firstly as mentioned in section 2.5., the Autism Education Trust state that many children with ASD will attend mainstream school (AET, 2008) and as such it is necessary to develop a range of appropriate strategies and suitable interventions to address their needs (Ali & Frederickson, 2006). Secondly, primary schools were considered to be most accessible as the structure and organisation, in which children are likely to be taught within the same classroom and supported by the same teaching staff, would promote the consistency that was important for the implementation and evaluation of the Social Story intervention.

Upon receipt of the completed consent forms participants were selected for the study through a process of purposive sampling. A purposive sampling approach is one in which particular individuals are chosen to participate in order to satisfy the specific needs of the study (Robson, 2002). Participants were selected for the study based on the presentation of a problematic behaviour which, during the pre-intervention interviews with teaching staff and children (see section 3.3.3), was deemed to be appropriate for a Social Story intervention. Behaviours were deemed appropriate when they were viewed as problematic for the child; and/or they were having a detrimental impact on children's relationships with peers; and/or they were impacting on their ability to learn in class. These behaviours had to be occurring on at least a daily basis in order for the child to be included in the study.

Importantly, children could only participate in the study if they were not currently receiving any other form of intervention such as social skills or behavioural support programmes, in order to attempt to control for nuisance variables.

Having identified the sample, the participating children were randomly allocated to receive stories with either photographs or symbols in order that the effectiveness of different forms of illustration could be evaluated (see Table 3.5.2). By applying random allocation the researcher hoped to create equivalent groups of participants to receive the two different story formats increasing confidence that any differences between the measures of behaviour could be attributed to the manipulation of the illustrations (Robson, 2002).

### 3.3.3. Target Behaviours

Pre-intervention interviews were conducted with the aim of gathering important information to verify the appropriateness of the child's inclusion in the study and to guide the development of the Social Stories.

As Gray (1995, 2003) explains, it is important that Social Stories are personalised to the individual child following a detailed assessment of their needs. Furthermore, as the evaluation of the effectiveness of the intervention was dependent on accurate recording of observations, it was important that the behaviour was specific and could be readily measured (Barlow et al, 2009). With this in mind, interview questions were generated for the children and key adults in order to obtain data relating to the specific nature of the difficulties the children were experiencing, to gain an insight into the child's views and level of comprehension and to identify and define 'target behaviours'.

Short semi-structured interviews were conducted by the researcher with each of the teachers, teaching assistants and children participating in the study. Semi-structured interviews consist of predetermined questions. The order of these questions and the wording used was modified based upon the interviewer's perception of what seemed most appropriate and particular questions could be omitted or added depending on the responses of the interviewee. The interviews comprised open ended questions which were felt to be flexible, allowing the interviewer to address any misunderstandings, and encourage co-operation and rapport. Whilst such questions are more difficult to analyse than closed questions as they can produce unexpected answers, at this stage in the procedure, it was more important to gain detailed information than it was to quantify responses (Robson, 2002).

The teacher / teaching assistant interviews consisted of four pre-set questions aimed at identifying specific information about the child's target behaviour e.g. the setting in which it occurred, a description of the behaviour, the frequency of the behaviour and the desired alternative and functionally equivalent behaviour. (See Appendix D for a copy of the pre-intervention teacher / teaching assistant interview transcript).

The children's interviews consisted of 3 pre-set questions aimed at finding out about the child's interests, something they thought they were good at in school and something they would like to be better at in school (providing the opportunity to gain the child's perspective on the target behaviour). In this way the researcher was able to adhere to the first of the '10 defining criteria and guidelines for Social Stories' (Gray, 2004) that suggests they should applaud achievements. At the end of this session consent was sought from each of the children. They were firstly asked if they were happy for a story to be written for them concerning their target behaviour and secondly if they were happy for their teachers to record their progress so that it could be shared with others to help other children in the future. (See Appendix E for a copy of the pre-intervention child interview transcript).

On completion of these interviews target behaviours were identified for each of the children in this study and these have been summarised in Tables 3.3.2.
These varied widely, ranging from low frequency behaviours such as 'play-fighting at play-time' and 'getting anxious about play-time' to the higher frequency behaviours of 'pushing in the line when lining up' and 'anxiety at being looked at'. Such variation adds further justification to the adoption of a SCED as such an approach allows for an examination of individual behaviour variations which might be obscured when data are averaged across groups of participants (Neuman & McCormick, 2000).

| Participant No. | Age | Year | Diagnosis | Illustrations | Target Behaviour |
|---|---|---|---|---|---|
| 1 | 7 | 3 | Asperger Syndrome and Attention Deficit Hyperactivity Disorder | Photographs | Not paying attention in class |
| 2 | 8 | 4 | Asperger Syndrome and Attention Deficit Hyperactivity Disorder | Photographs | Play-fighting at playtime |
| 3 | 6 | 1 | Asperger Syndrome | Photographs | Not following instructions for lining up |
| 4 | 5 | 1 | Asperger Syndrome | Photographs | Getting upset if not the first to answer |
| 5 | 11 | 6 | Autism Spectrum Disorder, Disorder of Attention, Motor-Coordination & Perception & Attention Deficit Disorder | Photographs | Forgetting belongings |
| 6 | 7 | 3 | Asperger Syndrome | Symbols | Getting upset about playtime |
| 7 | 10 | 5 | Autism Spectrum Disorder | Symbols | Getting upset about being looked at |
| 8 | 11 | 6 | Asperger Syndrome | Symbols | Leaving the classroom during lessons |
| 9 | 10 | 5 | Asperger Syndrome | Symbols | Not paying attention in class |
| 10 | 8 | 4 | Pervasive Developmental Disorder, Attention Deficit Hyperactivity Disorder & Global Learning Difficulties | Symbols | Pushing in the line when lining up |

**Table 3.3.2: A table providing details of individual participants, showing the form of illustration which they were randomly allocated to receive and outlining their target behaviours**

### 3.3.4. Instruments & Measures

#### 3.3.4.1. Behaviour Log

A structured observation schedule, called a Behaviour Log, was employed in order for measures of the frequency of the target behaviour to be recorded prior to, during and after the Social Story intervention.

Structured observation schedules provide a systematic approach to observation which is believed to reduce the influence of individual perceptions and biases (Denscombe, 2003). They require an external observer to systematically record behaviours as they occur (Haynes & O'Brien, 2000) and thus necessitate the development of a coding scheme for identifying and recording behaviours.

When developing the coding scheme the researcher took into account Robson's (2002) considerations, ensuring that by adhering to the codes it would be possible for the observer to identify the behaviour quickly and efficiently thus maximising the validity of the measure (Haynes & O'Brien, 2000). See Table 3.3.3 for a summary of these considerations.

| |
|---|
| The 'Coding Schemes' were devised to be: |
| 1. **Focused:** Looking only at the specific target behaviour. |
| 2. **Objective:** Requiring little inference from the observer. |
| 3. **Explicitly defined:** Through a detailed operational definition of the target behaviour (both what falls within the definition and what doesn't). |
| 4. **Exhaustive:** Covering all possibilities of what the behaviour might look like in order that it was always possible to make a coding when the behaviour occurred. |
| 5. **Easy to record:** Just ticking a box. |

(Adapted from Robson, 2002, page 332)

**Table 3.3.3: Considerations made in developing the coding scheme.**

Operational definitions of the behaviours were developed to be focused, objective, explicit and exhaustive. Utilising information from the pre-intervention interviews, the researcher worked with the observer (the child's designated Teaching Assistant) to develop definitions of the target behaviours which outlined both what comprised the behaviour and what didn't. In this way, the observer could be confident in noting whether or not it had occurred (Robson, 2002). (See Appendix F for the operational definitions for each of the target behaviours).

An event sampling approach was utilised, in which the unit of measurement was the behaviour itself (Irwin & Bushnell, 1980) as this was believed to provide the easiest format for recording. In event sampling the observer records each instance of a specific behaviour as it occurs during a specified time period, in this instance a school day, often by means of a tally mark. As such, event sampling is considered to be appropriate for finding out the frequency of observed behaviours (Cohen et al, 2000).

Having considered these issues, a Behaviour Log was designed incorporating the operational definition of the child's target behaviour along with a daily tally chart that was considered to be simple to use, promote the replicability of measures and count against observer fatigue (See Appendix G for a copy of the Behaviour Log).. It was hoped such a format would increase the reliability of the recordings (Barlow et al, 2009) in a busy classroom environment.

Each child's designated teaching assistant was asked to record on the Behaviour Log whenever the target behaviour occurred during the course of each day over the three experimental phases. The observation schedules were piloted for a week prior to the study to ensure that both the coding scheme and the behaviour log forms enabled systematic recording of behaviour by an external observer with the aim of promoting the reliability and validity of the measure.

### 3.3.4.2. Strengths & Difficulties Questionnaire (SDQ) (Goodman, 1997)

The SDQ is a brief behavioural screening questionnaire for use with 4-16 year olds which exists in several versions to meet the needs of researchers, clinicians and educationalists. It comprises of questions relating to psychological attributes and impact questions relating to the impact the child's behaviour may be having on others. In addition it includes follow up questions aimed at identifying whether the intervention has reduced any problem behaviours or had a positive impact in a different way.

Studies have shown the SDQ to be sensitive to treatment effects and as such it is deemed to be an effective method for evaluating the effectiveness of interventions (Mathai, Anderson & Bourne 2003). The SDQ has also been selected as one of the 3 key Child & Adolescent Mental Health Service (CAMHS) Outcome Research Consortium (CORC) measures for gathering the views of children, parents and practitioners when evaluating the outcomes of interventions and services (Wolpert et al, 2008).

SDQs are available for completion by parents and teachers for 4-16 year olds and self-completion questionnaires have also been designed for young people from 11-16. There is evidence to suggest that this self-completion questionnaire is applicable from 8 years (Muris, Meesters, Eijkelenboom and Vincken, 2004) but as a number of the participants included in this study were younger than 8 it was decided that the self completion SDQ would not be applicable. The choice was made not to administer parental SDQ as the Social Story interventions were specifically aimed at school based target behaviours. This study therefore utilised only the teacher version of the SDQ and this was administered at the beginning and the end of the 6 week intervention. As such, it provided a pre and post behavioural screening for each of the participants.

The researcher recorded the total SDQ scores comprising of 20 items, five from each of the following subscales:

- Emotional Symptoms
- Conduct Problems
- Hyperactivity / Inattention
- Peer Relationship Problems

(www.sdqinfo.com)

(See Appendix H for a copy of the SDQ).

### 3.3.4.3. Pre & Post Intervention Teacher / Teaching Assistant Questionnaires (TQ)

The final measure was a brief self completion pre & post intervention Teacher / Teaching Assistant Questionnaire (TQ) designed by the author to elicit information about the views of the key adults on the impact of the Social Story intervention.

The advantage of using self-completion questionnaires is that they enable a large amount of data to be gathered relatively cheaply and within a short time-frame. Respondents are free to complete questionnaire at a time that is convenient to them and they have the space to think and reflect about their answers. Additionally self completion questionnaires eliminate the influence of external factors related to the presence of the interviewer (Robson, 2002).

Whilst there is often a very low response rate to questionnaires, it was hoped that by keeping questions to a minimum and delivering and collecting them by hand, participants would be more likely to engage.

The questionnaires incorporated a mixture of open and closed questions as well as rating scales. It is important to acknowledge here that participants will often opt for mid-point responses on rating scales to avoid the extreme polar views and that there is also no way of knowing if the respondent might have wished to add any other comments about the issue under investigation. However, rating scales offer a degree of sensitivity and differentiation of response while still

generating numbers and are therefore considered to be "particularly useful for tapping into attitudes, perceptions and opinions" (Cohen, 2007). Furthermore, an *'any other comments:'* section was added to the end of the post-intervention questionnaire with the aim of gaining any additional information that could provide information that was relevant to the research questions.

The pre-intervention TQ contained just 3 items. There were two open questions, enabling staff to outline the child's target behaviour and describe current strategies, and one rating scale question where the teacher was asked to rate how challenging they were finding this behaviour on a 10 point scale (1 being 'not very' and 10 being 'very').

The post-intervention TQ consisted of 5 items, 4 in the form of rating scales and one closed question based on items contained within the Behaviour Intervention Rating Scale (BIRS) (Elliot & Treuting, 1991). These scales were developed to measure teachers' perceptions of treatment acceptability and perceived effectiveness of classroom interventions. A correlational analysis of the BIRS has identified it as a valid measure of treatment evaluation and as a consequence it provided a useful basis for the development of this post-intervention TQ (Elliot & Treuting, 1991).

Teachers and teaching assistants were asked to rate how challenging they were finding the behaviour, how effective they found the Social Story to be in addressing the specific behaviour and how easy they found it to implement the story on the same 10 point scale as was used prior to the intervention. The final closed question asked the staff to state whether or not they would use a Social Story intervention again. (See Appendix I for copies of the pre & post intervention TQs).

### 3.3.4.4. Social Story Guidelines & Checklist

The designated teaching assistants who would be implementing the Social Story were provided with Social Story Guidelines and a Checklist pro-forma. This outlined the procedures for the administration of the intervention to ensure consistency of approach across participants and promote treatment integrity. Staff were asked to record on the checklists whether they had read the Social Story, when it had been read and whether subsequent prompts had been given. (See Appendix J for copies of the Social Story Guidelines & Checklist).

### 3.3.4.5. Social Stories

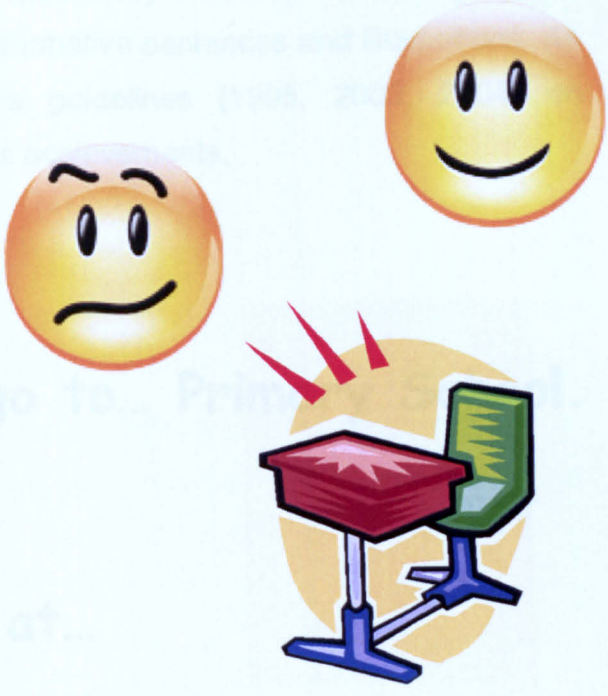
Social Stories were constructed for each of the participants in the study. Previous research into their effectiveness has been criticised on the basis that many of the stories evaluated in the studies failed to adhere to Gray's recommendations (Kuoch & Mirenda, 2003). Therefore in the current study, every story was written by the researcher alongside a member of the Autism Outreach Service following the criteria and guidelines outlined by Gray (2004).

Stories were composed to meet the needs of each individual child (Gray, 1995) utilising the information that had been gathered from the pre intervention Teacher / Teaching Assistant & Child Interviews.

They each followed an identical format and structure, but for the experimental manipulation of the illustrations which required half of the stories to be produced using only photograph illustrations and half to be produced using only symbol illustrations comprising of clipart pictures and emoticons (stylised faces that represent emotions).

E.g.

Photograph Illustrations



Symbol Illustrations

The stories were typed on white A4 paper and the front cover of each contained a title which identified the topic, was positively worded and typed in black and emboldened Comic Sans MS, font size 48.

E.g.

**A story about...**

Underneath the title there was an illustration (either a photograph or a symbol depending on the experimental condition) that represented the story topic and the child's name was printed in the bottom left corner.

All of the stories were between 5 and 7 pages long and were written in black Comic Sans MS bold type, font size 20.

The first page of every story focused specifically on the child's strengths and interests by including descriptive and affirmative sentences and illustrations As such, the stories adhered to Gray's guidelines (1995, 2003, 2004) on personalisation and applauding a child's achievements.

E.g.

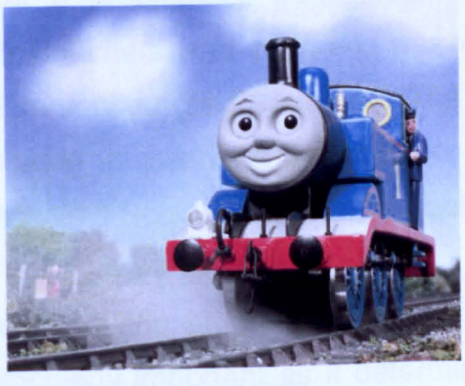
**My name is... and I go to... Primary School.**

**At home I like...**

**At school I am good at...**

The illustrations on this first page were neither photographs nor symbols, but pictures obtained from Google Image searches that represented the child's hobbies.

E.g.



The subsequent pages contained between 1 and 3 sentences and 1 and 2 illustrations (either photographs or symbols depending on the experimental condition). The sentences in each of the stories adhered to Gray's (1994) suggested ratio of two to five co-operative, descriptive, perspective and/or affirmative sentences for every directive or control sentence.

Each page was laminated in order to preserve it and each story was bound with a black plastic spiral binder. (See Appendix L for examples of a Social Stories utilising photograph or symbol illustrations).

### 3.3.5. Procedure

**3.3.5.1. Pilot Study:** Fixed design experimental studies can and should be piloted in order that the researcher can make certain that methods of data collection are technically and conceptually appropriate for providing answers to research questions (Robson, 2002). As such, a small scale pilot study was undertaken.

There were two children participating in the pilot. Both of them had a diagnosis of ASD and attended mainstream primary schools located within the same West Midlands Local Authority as the study itself. One of the children was 6 (Year 2) and the other 8 (year 4) and both were boys.

As with the main study, participants were selected for the study based on the presentation of a problematic behaviour which, during the pre-intervention interviews with teachers and children, was deemed to be appropriate for a Social Story intervention (see Section 3.6.1.1. for details). One of the children was then allocated to receive a Social Story with photograph illustrations and the other to receive a Social Story with symbol illustrations.

Adequate piloting of the aforementioned instruments and measures (section 3.3.4 was particularly important as it determined how effective they would be, and increased confidence in relation to issues of validity and reliability.

Data generated by interviews and questionnaires is believed to be improved by ensuring questions are unambiguous and comprehensible (Robson, 2002). Consequently, those participating in the pilot study were asked for feedback on the wording and order of items. This provided insight into the potential range of responses and an opportunity to revise any questions that were not answered as expected.

Having received feedback, questionnaires were refined and adapted and the final drafts incorporated some of the suggestions made by the teachers. These changes included re-wording of sentences and questions to increase clarity. Additionally, although all of the staff reported that the frequency tally charts were easy to complete, one observer had some difficulty identifying the target behaviour and it was necessary to have a further conversation to determine a more explicit definition. This highlighted the need to establish clear descriptions and definitions of the target behaviour during the pre-intervention Teacher / Teaching Assistant Interview.

Aside from the information obtained regarding the research instruments, the piloting exercise exposed a number of procedural issues. Despite the researcher discussing the implementation of the Social Stories with teaching staff at the outset of the study, feedback interviews revealed that in some instances there had been a failure to adhere to the guidelines. Such an issue would have resulted in a threat to the internal validity of the results of the study had it not been identified at this early stage. Furthermore, at the end of the Intervention Phase, one member of staff reported that they had misplaced the Behaviour Log sheets and they could not remember how to complete them. Having noted these issues, the researcher produced a set of guidelines and a checklist for teachers to follow and complete during the intervention to promote treatment integrity. The decision was also taken to make contact with each of the teachers involved in the study at the start of each of the experimental phases in order to monitor the progress of the intervention.

Conducting the pilot was invaluable in highlighting a number of procedural issues that could have threatened the execution of the study and the reliability and validity of the results had they not been identified at this early stage.

**3.3.5.2. Baseline Phase Procedure (weeks 1 & 2):** Following completion of the pre-intervention interviews and questionnaires, two baseline weeks were undertaken. During this period staff were instructed to continue with their regular classroom practice and behaviour management procedures and to

record baseline measures of the child's target behaviour using the Behaviour Log sheets.

**3.3.5.3. Intervention Phase Procedure (weeks 3 & 4):** It was crucial during this phase of the study to ensure treatment integrity. Treatment integrity or fidelity refers to the extent to which an intervention is implemented as intended or planned and as such helps to reduce threats to internal validity (Wilkinson, 2006). It is discussed in greater detail in section 3.4.8.2.

To address these issues, staff were provided with a Social Story Guidelines and a Checklist pro-forma outlining the procedure for administering the story.

At the start of the first day of the Intervention Phase the Social Story was introduced to the child by the teaching assistant. Teaching Assistants were instructed to introduce the story to the child individually in a location that minimised distractions. The guidelines stated that the member of staff should *'briefly explain the purpose of the Social Story prior to the first reading e.g. "this is a story that has been written especially for you to help you to..."'*

On completion of the first reading, the guidelines stipulated that the member of staff should *'ensure the child understands the story by asking a few simple comprehension questions e.g. "Can you tell me what the story was about? What does it suggest you do when...?" etc.'*

Staff were required to read the Social Story everyday for the first week of the Intervention Phase and every other day for the second week. It was suggested that, *'if possible, the same person should read the story at approx the same time each day e.g. either at the start of each day or prior to the target situation.'* Whilst the story was only to be read once during the day, staff were told that it could *'be referred to as a prompt if the target behaviour occurs.'*

Staff were asked to record on the story checklist whether they had read the Social Story on the required day, when it had been read and whether subsequent prompts had been given.

Throughout the 2 weeks of the Intervention Phase staff continued to measure the child's target behaviour using the behaviour log sheets.

**3.3.5.4. Maintenance Phase Procedure (weeks 5 & 6):** At the end of the Intervention Phase the researcher visited each of the schools to collect copies of the Social Stories and to deliver a Maintenance & Post-Intervention Questionnaire pro-forma.

Staff were informed that the Social Story should not be read to the child during the maintenance phase but they were advised that they could refer to them *'during the day to prompt the child to remember the appropriate behaviour'*. They were required to record if prompts had been given on the behaviour log sheets along with measures of the child's target behaviour.

Staff were also provided with copies of the post-intervention Teacher / Teaching Assistant Questionnaires and the post-intervention SDQ and asked to complete these at the end of the six week process.

## 3.4. Strengths, Limitations & Issues of Validity & Reliability

It is important at this stage to acknowledge the limitations and threats to validity and reliability that are inherent within the study design. These will be outlined below and discussed in depth again in Chapter 5 in section 5.4.

### 3.4.1. Strengths & Limitations of the Study Design

Multiple SCEDs were used to structure this study. An ABA approach was adopted in order to assess the impact of the Social Story intervention on each of the individual participants over time during Baseline (A); Intervention (B) and Maintenance (A) phases. An ABA design was selected as it is considered to be stronger than an AB design due to the reversal phase. Furthermore, the addition of this phase offered a mechanism for assessing the maintenance of learning from the Social Stories (Robson, 2002). In spite of this, the researcher

acknowledges that such designs are open to ethical objections on the grounds that they might involve the removal of an effective intervention (Barlow et al, 2009; Robson, 2002).

Whichever approach is chosen, SCEDs are considered to possess high levels of internal validity due to the continuous measurement of participant's responses over time determining that they act as their own controls (Barlow et al, 2009; Robson, 2002). In this way they are believed to provide an opportunity to identify cause-and-effect relationships between independent and dependent variables within a real world context (Neuman & McCormick, 2002). However, they are criticised for possessing low external validity (Reynhout & Carter, 2007). This threatens to limit the ability to generalise from the findings of this study but replicating the experiment with multiple participants should help to address this issue (Tawney & Gast, 1984).

The 'gold standard' in true experiments is considered to be the RCT as they are believed to provide the best evidence for the effectiveness of an intervention and to promote external validity (Robson, 2002). However proponents of SCEDs would point out that group comparisons and randomised controlled trials are not exempt from issues of generalisation (Barlow et al, 2009). Indeed, Barlow et al (2009) would assert that averaging responses from random heterogeneous group samples reduces the likelihood that findings will be relevant to an individual; whilst identifying variability with individuals should provide important information about the responses of similar individuals undergoing the same treatment.

It is of note too, that only two of the studies included in the literature review in Chapter 2 utilised RCT designs. This reflects the difficulty of undertaking such experiments in real world settings (Robson, 2002) and is illustrative of the limitations of such designs when applied to experimental evaluation and social research in general (Pawson & Tilley, 1997).

Whilst the researcher appreciates that the adoption of an RCT or group design might have promoted external validity, such a design would have created practical and ethical problems. Firstly, in order to investigate the effectiveness

of Social Story interventions for children with a diagnosis of ASD, participants had to be identified as presenting with specific social behaviours that were impacting on their ability to function successfully in the school setting. An RCT design would have necessitated that half of these participants be denied a Social Story intervention that could have helped to promote more appropriate behaviours and facilitated their inclusion. Although a waiting list control could have been adopted in which participants, in the control group received the Social Stories at the end of the study, it would have been difficult to justify this six week delay where children were experiencing significant difficulties.

Having argued for the methodology adopted within the current study the researcher will now go on to consider the issues of validity and reliability that are associated with such a design.

### 3.4.2. Issues of Validity & Reliability

Issues of validity and reliability are central to effective research and whilst it is not possible to eliminate all possible threats (Cohen et al, 2007), it is necessary to consider them as failure to do so can render the results of a study to be worthless.

Researchers must pay careful attention to the identification and control of such threats in order that the effects can be ameliorated and each of these issues should be considered within the research paradigm that has been adopted (Cohen et al, 2007).

In their paper discussing the use of single subject research to identify evidence-based practice, Horner et al, (2005) highlight the defining features of SCEDs in relation to validity and reliability. These features and other issues that relate specifically to this study have been outlined in Table 3.4.1 and will be discussed below.

### 3.4.3 Description of Participants and Setting

For a study to be replicable it is necessary to provide operational definitions of the participants, the settings and the process by which the participants were

selected (Wolery & Ezell, 1993). As such, information regarding the participants' needs, ages, the schools they attended and the selection criteria for the study has been presented in Section 3.3.2.

### 3.4.4 Baseline

The baseline phase in SCEDs is similar to the control condition in group designs as it is used to compare the effects of the implementation of the intervention. Comparisons are made by analysing patterns of performance in the baseline phase and in subsequent phases and as such it is recommended that a clear description of the baseline condition should be provided (see section 3.3.5.2).

In addition, it is suggested that the dependent variable should continue to be measured during baseline until a sufficiently consistent pattern is observed (Horner et al, 2005). The constraints of the school term meant that it was not possible to continue to implement baseline procedures until a stable pattern emerged and consequently the baseline phase was restricted to a 10 day period for each participant. Whilst this meets Horner et al's (2005) suggested acceptability criteria of 5 or more data points, it does present issues with regards to data analysis (these issues will be explored further in section 4.3.1).

| | | |
|---|---|---|
| Reliability | Description of participants & Settings | The participants, the process for selecting them and the features of the physical environment should be described with replicable precision. |
| | Baseline | The Baseline phase should provide repeated measurement of the dependent variable to establish a pattern of responding. Baseline conditions should be described with replicable precision. |
| | Observational Data | Observational data requires the systematic recording of behaviour by an external observer. This should involve the development of a Coding Scheme for identifying and recording behaviours quickly and efficiently. |
| Validity | Dependent Variables | Dependent variables should be operationally defined, measured with replicable precision, measured repeatedly over time and assessed for consistency. |
| | Independent Variables | Independent variables should be described with replicable precision and be systematically manipulated. |
| | Internal Validity | The design should provide repeated measures of experimental effect during different phases. The design should control for common threats to internal validity. |
| | External Validity | Experimental effects should be replicated across participants, settings or behaviours. |
| | Social / Ecological Validity | Social / Ecological validity refers to the extent to which experimental outcomes give an accurate portrayal of the reality of the social situations within their natural and conventional settings. The dependent variable and the magnitude of change in the dependent variable should be socially important. The implementation of the independent variable should be practical and cost effective. |
| | Content Validity | Content validity refers to the extent to which a scale measures what it sets out to measure what it sets out to measure and represents every aspect of a particular social construct. |
| | Construct Validity | Construct validity refers to whether a scale measures or correlates with a psychological construct. |
| | Concurrent Validity | Concurrent validity is demonstrated whereby there is a high correlation between different measures that have been taken at the same time. |

**Table 3.4.1: Issues of Validity & Reliability**

### 3.4.5. Observational Data

The researcher aimed to increase the reliability of the observational data by developing focused, objective, explicit and exhaustive operational definitions of the target behaviours and designing a Behaviour Log sheet that was simple to use, (Barlow et al, 2009; Robson, 2002). It was also initially intended to employ a second observer to record behaviour during specific sessions, enabling a measure of inter-observer reliability to be calculated. However, it was not feasible to carry out these additional observations given the time constraints of this project.

The children's designated teaching assistants were asked to record every time they observed the target behaviour. They were chosen to take on this role as they considered more likely to be able to focus on the individual child than the class teacher. Despite this, it is still possible that in a busy classroom environment their ability to attend to specific behaviours could have been variable threatening the reliability of the data.

### 3.4.6. Dependent Variables

The dependent variables in a SCED study are usually the observable behaviours (Horner et al, 2005). Consequently, for people to be able to conclude with any confidence that that the findings of this study could be replicated it was necessary to ensure that the target behaviours (dependent variables) possessed the following characteristics:

**3.4.6.1. Dependent variables are operationally defined:** as Horner et al (2005) state, dependent variables that allow for direct observation are preferable to those which are defined subjectively. It was with this in mind that operational definitions of the behaviours were developed (utilising information from the pre-intervention interviews) to be focused, objective, explicit and exhaustive.

#### 3.4.6.2. Dependent variables are measured repeatedly

By ensuring that sufficient measurements of the target behaviour were observed and recorded across the three experimental phases (10 observational

days per phase), it should be possible to establish the overall pattern of performance under different experimental conditions (Horner et al, 2005).

#### 3.4.6.3. Dependent variable recording is assessed for consistency

It is recommended that the consistency of recording is assessed by frequent monitoring of interobserver agreement e.g. the percentage of observational units in which independent observers agree (Horner et al, 2005).

As stated previously (section 3.4.3.2) it was not possible within the time and staffing constraints of the current study to conduct simultaneous researcher observations. Consequently, participating teachers and teaching assistants were issued with Social Story Guidelines and Checklists in order to promote consistency of approach both within and across participants

#### 3.4.6.4. Dependent variables are selected for their social significance

Dependent variables should be selected not only in order to allow the assessment of conceptual theory but also because they are perceived to be important for the participants (Horner et al, 2005).

The dependent variables in this study were the measures of the frequency of the target behaviours, SDQ and TQ responses about the perceived impact of the intervention. Both of these would seem to be highly relevant measures of the effectiveness of social stories in educational contexts. They provide an assessment of the conceptual theories underpinning Social Story interventions (see Section 2.6.4) and provide information about the target behaviour which is important both to the child and the adults who teach them.

### 3.4.7 Independent Variables

As Cohen et al (2007) explain, it is imperative that independent variables are adequately described in order that any future replications of the experiment are possible.

The independent variables in a single case experimental research are typically the intervention(s) which is under investigation (Horner et al, 2005) and as such in this study they were the Social Stories with photographs and with symbols.

To promote replicability, detailed descriptions of the composition of the stories have been provided within the method section as general descriptions may be prone to high variability (Horner et al, 2005). Moreover, a comprehensive explanation of the procedure and of the instruments and measures has been given and examples of these and of the Social Stories have been included in Appendices B to H. In this way the researcher hopes it will be possible for future replications of the study to be undertaken.

### 3.4.8 Internal Validity

As Horner et al, (2005) state, single case experimental designs intrinsically control for threats to internal validity through the repeated measurement and therefore repeated demonstration of the experimental effect at different time points with a single participant. There remain however, a number of issues that must be considered and these are discussed below.

#### 3.4.8.1. History

Firstly, in educational research, it is not uncommon for events other than the experimental treatments to occur during the time between pre-test and post-test (Cohen et al, 2007). When such events do occur, it is possible that they can affect the outcomes of the experiment which can mistakenly be attributed to the intervention.

This issue was addressed at the outset when it was specified that, in order to participate in this study, children could not be receiving any additional interventions such as involvement in social skills groups or simultaneous

behavioural approaches. In controlling for this, it is possible to rule out the prospect that participant outcomes were due to the success or presence of alternative support strategies.

### 3.4.8.2. Treatment Integrity

Issues can also arise with regard to treatment integrity which, as stated earlier, refers to the extent to which an intervention is implemented as intended (Wilkinson, 2006). Gutkin (1993) asserts that interventions and treatment plans implemented with poor integrity make it difficult to draw accurate inferences about the relationship between an intervention and behaviour change.

Systematic observation, incorporating measures of inter-observer reliability, is the most direct means of assessing treatment integrity. However, the procedure is vulnerable to reactivity effects e.g. researcher bias, is labour intensive and is not always feasible given the time constraints and logistical problems associated with 'real world' research in school settings.

With these constraints in mind, the researcher attempted to control for treatment integrity by a method of participant self-reporting. As such, guidelines were established for the construction and administration of the social story, utilising the same materials and promoting a uniform approach across all participants. A daily Checklist sheet was used to assess treatment integrity and teachers were required to indicate whether the story was read, when it was read and whether prompts were provided to remind the pupil of the social story throughout the school day. By adopting a self-report checklist the researcher is aware that there is the potential for respondent bias, (see Section 3.4.3.4) but believes that within the practical confines of the study this strategy was the most appropriate.

### 3.4.8.3. Selection Bias

Selection bias refers to the problem that difference in the selection of participants for the two different Social Story formats may be responsible for the observed outcomes (Cohen et al, 2007). To overcome this threat, pupils were randomly allocated to either the 'photograph' or 'symbol' condition.

### 3.4.8.4 Respondent Bias

Respondent bias refers to a type of cognitive bias which may affect the way a respondent answers a question.

Aspects of the current study were vulnerable to issues of respondent bias. The self-report nature of each of the measures e.g. the Behaviour Log, the SDQ, the TQ and the treatment integrity checklist open up the possibility that respondents may provide answers intended to please the researcher. Such measures were though still believed to be more favourable to semi-structured interviews as respondents were free to complete the forms at a time that was convenient to them and they had the space to think and reflect on their answers away from the influence and presence of the interviewer (Robson, 2002). Whilst simultaneous researcher observations might have helped to reduce this threat further, it was not possible to conduct these within the time constraints of the study.

### 3.4.8.5. Researcher Bias

Researcher bias refers to the assumptions and preconceptions the researcher brings to the process that may influence the research. In particular, the researcher's assumptions might influence the ways in which they behave in the research setting, the participants selected for the study, the kinds of questions asked or the selection of the data reported upon.

This issue was addressed by ensuring there was minimal involvement in the project once the research was underway and by adopting a methodological and data triangulation approach (Robson, 2002).

### 3.4.8.6. Experimental Mortality

The loss of participants due to attrition and drop out is a major threat to validity in longer-running experiments. This threat was ameliorated by providing participants with detailed information about the nature and duration of the project within covering letters. These were distributed to parents and school staff prior to the start of the study and established consent from all those involved.

### 3.4.9. External Validity

A key concern associated with SCEDs is the extent to which it is possible to generalise from the findings relating to individuals to other participants, locations and behaviours (Horner et al, 2005). The threats that are associated with external validity are discussed below.

#### 3.4.9.1. Lack of representativeness of available and target populations

This threat refers to the issue that those who are participating in the study may not be representative of the population to which the researcher seeks to generalize the findings (Cohen et al, 2007). Such issues arise from poor sampling and randomisation and both are discussed in the following sections.

#### 3.4.9.2. Sampling

A purposive sampling approach was selected for this study, which by its very nature limits the extent to which generalisations can be made to a wider population. This was however, not the researcher's primary concern. The sample was selected with the specific purpose of investigating the effectiveness of Social Story interventions for addressing the target behaviours of children with a diagnosis of ASD. Therefore the aim was to acquire detailed information about the effectiveness of Social Stories for this specific population of children.

Participants were therefore selected on the basis of diagnoses, the presentation of target behaviours and their suitability for a Social Story. As stated in section 3.6.1.1., the sampling frame was limited to mainstream primary schools as many children with ASD attend these settings (AET, 2008) and they were believed to provide the most accessible environments in which to conduct the research.

The result of this purposive sampling approach was that 10 children were selected from 8 different mainstream primary schools. The children ranged in age from 5 – 11 and they were all boys. All of the children had a Statement of Special Educational Needs (SEN).

The researcher accepts that in narrowing the sample to this population of children it will not be possible to generalise findings to specialist and secondary

settings; to girls; to boys under 5 and over 11; and for boys without a diagnosis of ASD and a Statement of SEN.

#### 3.4.9.3 Randomisation

Once the sample of 10 children had been selected, their names were placed in a pot and they were randomly assigned to the 2 experimental conditions (photograph illustrations or symbol illustrations). This process of random allocation was aimed at equalising the conditions, making it unlikely that they would differ in terms of pre-existing differences amongst the participants. This is considered to be essential to determine that the independent variables (photograph illustrations or symbol illustrations) caused an effect on the dependent variables (the frequency of the incidents of the target behaviour and the responses given on the TQ and the SDQ).

#### 3.4.9.4 Sample Size

The final issue to be considered here is the size of the sample. As with many single-case experimental design studies, the small sample size limits the external validity of the findings. The researcher attempted to strengthen the design by replicating the experiment with multiple participants.

### 3.4.10. Social / Ecological Validity

In educational research, social or ecological validity is particularly important and useful in identifying how policies and interventions impact "at the chalk face" (Brock-Utne, 1996). SCEDs have been used both to identify basic principles of behaviour and to identify interventions that are functionally related to socially important outcomes (Wolf, 1978).

In order to identify the effectiveness of a given intervention it is therefore necessary to know about the social / ecological validity (or practicality) of the procedures and the findings.

Horner et al (2005) assert that a researcher can demonstrate social validity by:

- selecting dependent variables that have high social importance;
- demonstrating that independent variables can be applied with fidelity in typical intervention contexts over time;
- demonstrating that those who implement the intervention report that the procedures are acceptable, feasible, effective and sustainable;
- demonstrating that the intervention was clinically effective.

Within the current study, the researcher has attempted to demonstrate these principles by:

- developing target behaviours in conjunction with the child and the key adults involved in supporting them through pre-intervention interviews (see Section 3.3.3);
- utilising Social Stories that are perceived to be unobtrusive and convenient, where there is no need for the child to be withdrawn from the classroom for any length of time minimising the potential for further social isolation and promoting ease of implementation (see Section 2.6.4);
- producing a post-intervention TQ that included scales to measure teachers' perceptions of treatment acceptability, effectiveness and sustainability (see Section 3.3.4.3);
- adopting a data triangulation approach in which the frequency of a child's behaviour and the perceptions of those around them were recorded. Such an approach aimed to demonstrate that the intervention produced a practically significant change e.g. an observable change that results from a minimal intervention and is also judged by the clinician or teacher to have led to a large change in the participant's behaviour (Brossart et al, 2006; Prentice & Miller, 1992) (See Section 4.3.3)

### 3.4.11. Content & Construct Validity

*Content validity refers to the extent to which a scale measures what it sets out* to measure and represents every aspect of a particular social construct; whilst *construct validity refers to whether a scale measures or correlates with a* psychological construct (Cohen et al, 2007).

Content and construct validity were important factors in this study in relation to the behaviour log, the pre and post intervention TQs and the SDQ.

The recording of the frequency of target behaviours presented a potential threat as the researcher had to ensure that her construction of the presenting behaviour agreed with the recorder's construction of the same behaviour. At the outset, this threat was addressed by using the pre-intervention interviews to identify and define the target behaviours and by developing a coding scheme in order that teachers could be confident that it had been observed prior to recording it on the Behaviour Log frequency chart.

The questions in the Pre & Post Intervention TQs used to rate the effectiveness of the social story intervention were based upon items included within the Behaviour Intervention Rating Scales. A correlational analysis of these scales has identified them as a valid measure of treatment evaluation constructs of acceptability and effectiveness (Elliot & Treuting, 1991).

Statistical analyses have proven the SDQ to be a valid and reliable measure (Goodman, 2001). A study conducted by Muris et al (2004) reported adequate levels of inter-rater agreement, whilst Mellor (2004) report satisfactory test-retest reliability.

### 3.4.12. Concurrent Validity

Concurrent validity is demonstrated when there is a high correlation between different measures that have been taken at the same time and was hoped to be achieved within this study through the use of triangulation.

Triangulation involves searching for convergence among multiple sources of information with the aim of strengthening the validity of findings (Creswell & Miller, 2000).

This study adopted a data-triangulation approach utilising more than one method of data collection to gather quantitative and qualitative data using a variety of measures. The Behaviour Logs, TQs and the SDQs were intended to provide data that could be used to answer the initial research questions. In combining these measures it was hoped that the researcher could improve the validity and reliability of the findings.

## 3.5. Ethical Considerations

This study was designed in accordance with the ethical guidelines as advised by the British Psychological Society: Ethical Principles for Conducting Research with Human Participants' within the Code of Ethics and Conduct (BPS, 2009). These principles were adhered to at all stages of the research. The principles most relevant to this project are those concerned with consent, the right to withdraw, debriefing and confidentiality.

### 3.5.1. Consent (Principle 2.3; BPS, 2009)

As the children participating in the study were under 16, covering letters were distributed to parents and school staff and consent was obtained prior to the start of the study. The covering letters detailed the objectives of the study, outlined the 'nature, purpose and anticipated consequences' and offered to give additional information if it were deemed necessary. The letter provided an overview of the research procedure in order that those involved were aware of what the process would involve. Consent for the use of photographs within the Social Stories was also obtained.

### 3.5.2. Right to withdraw & debriefing (Principle 2.5 & 2.6; BPS, 2009)

This letter also established the participants' right to withdraw from the study at any stage and offered a feedback and debriefing session to all involved if this

would be appreciated. Particpating schools were advised that they would be issued with an Executive Summary of the research study on completion of the project.

### 3.5.3. Confidentiality (Principle 2.7; BPS, 2009)

Within the covering letters, parents and school staff were assured that all information provided would be treated confidentially and, when written up, would not be identifiable. To this end, the author ensured that all data was kept in a locked filing cabinet. (See Appendix C for a copy of this letter).

## 3.6. Summary of Methodology

This Chapter has provided an account of the philosophical underpinnings of the current study before going on to describe the development of the research methodology. It has offered an explanation of the adoption of multiple SCED studies to evaluate the effectiveness of Social Stories for a purposive sample of 10 children with a diagnosis of ASD and provided detailed information relating to the participants, the materials and the procedure.

The data obtained from the study will be reported in Chapter 4 following a detailed discussion and description of methods of data analysis.

# CHAPTER 4: RESULTS

## 4.1. Introduction to Results

The results chapter will begin by providing a summary of the measures used within the study to obtain the data and a description of the methods used to analyse the data. Data for each of the individual participants will then be analysed separately in sections 4.5 to 4.15 and the chapter will conclude with a summary of the results relating to the experimental hypotheses in section 4.15.

## 4.2. Measures

A data triangulation approach was adopted for this study, utilising three different measures: the Behaviour Log (designed by the researcher); the Strengths & Difficulties Questionnaire (SDQ) (Goodman, 1997); and the Teacher Questionnaire (TQ) (formulated by the researcher). Each of these measures was intended to provide data that could contribute to answering the research questions. In adopting such an approach, the researcher was able to look for convergence among different sources of information ensuring a greater confidence in the validity and reliability of the findings (Creswell & Miller, 2000).

### 4.2.1. Behaviour Log

The Behaviour log involved teaching staff recording the frequency of the child's behaviour across the 3 experimental phases: Baseline; Intervention; and Maintenance. As mentioned in Section 3.3.4.1. completion of the Behaviour Log sheets required teaching staff to record, by means of a tally mark, each incident of the child's specific and pre-defined behaviour over the course of each day of the experiment. The operational definitions for each of the target behaviours are provided in Appendix F.

### 4.2.2. Strengths & Difficulties Questionnaire (SDQ) (Goodman, 1997)

Teacher responses for the 20 items on the pre and post SDQs were also totalled for individual participants. Higher total scores are said to indicate an

increased likelihood of clinically significant difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems.

#### 4.2.3. Teacher Questionnaire (TQ)

The final measure was the TQ based on items contained within the Behaviour Intervention Rating Scale (BIRS) (Elliot & Treuting, 1991). Scores were taken from the pre and post responses to the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'. Additional qualitative data was gathered from the remaining questions.

## 4.3. Discussion of Methods of Data Analysis

Over recent years there has been a focus on issues relating to the analysis of single case experimental data (Parker, 2006). Interest in this area has been fuelled, in part, by the growing drive for evidence-based practice (Stoiber & Kratochwill, 2000) as well as an increase in reliance on meta-analyses and a demand for objective evidence (Parker, 2006).

#### 4.3.1. Visual Analysis

Analysis of the data obtained from single case experiments (SCEDs) is commonly evaluated by the visual inspection of graphical data (Busk & Marasculio, 1992; Kazdin, 1976; Kratochwill & Brody, 1978; Parker, Brossat & Vannest, 2005). This form of analysis involves plotting the data across the separate phases of the SCED, interpreting level, trend and variability of performance (Horner, Carr, Halle, McGee, Odom, Wolery, 2005) and drawing conclusions about the causal relationship between the intervention and behaviour change (Barlow & Hersen, 1984). Proponents of this approach argue that it is particularly appropriate for analysing single case data and evaluating interventions as it is insensitive to weak treatment effects, ensuring that only large effects with obvious clinical significance are recommended (Norbakhash & Ottenbacher, 1994). Furthermore, they suggest that conducting statistical analyses on single case data may produce confusion between statistical and

clinical significance and reduce the usefulness of the design (Nourbakhash & Ottenbacher, 1994).

In spite of these assertions, many commentators criticise the use of visual analysis. They point to the lack of formal decision rules available to researchers or clinicians which introduces the possibility of bias and subjectivity (Bloom & Fischer, 1982; Hojem & Ottenbacher, 1988; Wampold & Furlong, 1981; Wolery & Harris, 1982). Others, comment upon the susceptibility of visual analysis to Type 1 errors (identifying a false positive) (Matyas & Greenwood, 1990; Todman & Dugard, 2001).

In part such concerns exist due to the possibility that there may be autocorrelation and serial dependence amongst time series data (Parker et al, 2005). As SCEDS involve the collection of data on single subjects over a period of time, the data points are frequently interdependent and there is growing evidence that suggests that this impacts on the reliability and validity of visual analysis (Allison, 1992; Greenwald, 1976; Keppel, 1982). Specifically, Matyas & Greenwood (1990) found that higher levels of autocorrelation increase the likelihood of Type 1 errors. Todman & Dugard (2001) also warn of the possibility of making Type 1 errors when analysing changes in trend, particularly if a trend has been ignored during the Baseline phase of an experiment indicating that there may have been spontaneous improvement prior to the implementation of the intervention. Indeed, many studies have questioned the reliability of visual inspection, finding levels of agreement between judges to be low (DeProspero & Cohen, 1979; Jones, Weinrott & Vaught, 1978; Ottenbacher, 1986; Wampold & Furlong, 1985). Even Kazdin (1982), one of the most vehement proponents of visual analysis, admits that the process permits subjectivity and inconsistency.

As a consequence of these concerns, several analysts have suggested that the visual analysis of graphical data be supplemented with quantitative measures. The most commonly used quantitative adjunct is the split-middle method of trend estimation developed by White (1974) and presented by White & Haring (1980). This technique, also known as the celeration-line approach, fits a trend line to the baseline data which projects into the treatment or intervention phase

allowing for a comparison of the obtained result with the predicted trend (Harbst, Ottenbacher & Harris, 1991). It provides a quantitative method of analysing graphical data as opposed to a formal statistical test (Hojem & Ottenbacher, 1988). Trend lines have been employed with the aim of increasing the reliability and validity of visual analysis based ratings (Brossart, Parker, Olson & Mahadevan, 2006) and evidence exists suggesting that their use is associated with improved levels of interrater agreement (Bailey, 1984; Hojem & Ottenbacher, 1988). However, other studies suggest that trend lines can create dependencies, maintain inconsistent judgements, and overemphasise trend to the neglect of other graphical features (Brossart et al, 2006; DeProspero & Cohen, 1979; Harbst et al, 1991; Hojem & Ottenbacher, 1988).

Another common approach utilised to supplement visual analyses is to calculate the percentage of non-overlapping data (PND). This procedure involves counting the number of data points in the intervention phase that do not overlap with the data points in the baseline phase and calculating the percentage. Its proponents argue that PND quantifies the impact of an intervention phase in a data series (Scruggs, Mastropieri & Castro, 1987), but they also advise that it should not be calculated when zero data are present in the baseline, which presents a major limitation (Olive & Smith, 2005).

### 4.3.2. Statistical Analysis

In addition to such quantitative adjuncts it is now widely acknowledged that visual analyses can and should be supplemented by more objective statistical procedures (Barlow, Nock & Hersen, 2009; Park, Marascuilo & Gaylord-Ross, 1990; Parker et al, 2005). In particular, statistical measures are thought to be of value when there is no stable baseline, when treatment effects cannot be well predicted e.g. when a new treatment is being evaluated, and when statistical control is needed for extraneous factors in naturalistic environments (Kazdin, 1982).

Whilst the disputes about the utility of statistics for analysing SCED data have largely been resolved (Parker et al, 2005), visual analysis still predominates as the preferred method of data analysis in SCED research (Busk & Marasculio,

1992; Kratochwill & Brody, 1978). In their paper, Parker et al (2005) looked at a sample of 124 single case studies from across the domains of counselling, clinical and educational psychology and found that 65% of them had used only visual analyses.

The apparent reluctance to utilise statistical analyses is likely to be multi-factorial. Firstly, whilst a growing number of statistical techniques for single case analysis have been identified (Barlow & Hersen, 1984; Kazdin, 1982), few have been applied and analysed. Secondly, as with visual analysis, the autocorrelation and serial dependency of data, so commonly associated with SCEDs, violates the assumptions of independence that are made by most statistical techniques (Fox, 1991; Wolery & Harris, 1982). The third issue is that the few comparative studies that have been undertaken on these techniques have concluded that they produce quite different results (Parker et al, 2005). The choice of statistical test for the analysis of SCEDS is therefore controversial (Robson, 2002) and is dependent on the experimental question and the resulting data (Barlow et al, 2009).

#### 4.3.2.1. Parametric Statistics

Parametric statistics such as t-tests and analysis of variance, whilst commonly used to assess whether a significant change has occurred between the different phases of an experiment, are considered to be problematic for the analysis of single case research (Barlow et al, 2009). SCEDs are usually characterised by a small sample size, as is the case in the current study, and as Seigel & Castellan, 1988 explain, the smaller the sample size the more difficult it is to be confident that parametric assumptions are met. Amongst other things, parametric tests assume independence of data and normal distributions. As descriptive statistics indicate that both of these assumptions were violated within this study, these measures would be inappropriate.

#### 4.3.2.2. Interrupted time-series

Interrupted time-series analyses are also suggested as they are not reliant on parametric assumptions. Time-series approaches are recommended when feasible due to their ability to overcome issues of autocorrelation (Barlow et al

2009; Kazdin, 1984). However, as time-series approaches require a minimum sequence of 50 data points (Barlow et al, 2009; Robson, 2002) they are often inappropriate for the majority of SCEDS. It is for this reason that they were not suitable for analysing the 30 data points that were obtained from each of the participants in the current research project.

#### 4.3.2.3. Randomisation tests

One promising technique is the use of randomisation tests (Barlow et al, 2009; Todman & Dugard, 2010). As with interrupted time-series analyses, randomisation tests make no assumptions about the distribution of data but they do assume that experimental conditions are randomly assigned to observation occasions or groups of occasions (Barlow et al, 2009). This technique is often considered to be impractical (Ferron & Onghena, 1996) as the power of randomisation tests is directly proportional to the number of ways the intervention can be randomised and they have a high computational burden (Barlow et al, 2009). Whilst these issues have been addressed by utilising re-sampling procedures, Barlow et al (2009) recognise that to date the available software for carrying out these procedures is not readily available. It is for these pragmatic reasons and as a consequence of the non-random assignment of conditions to different occasions that the use of randomisation tests was deemed inappropriate to analyse the data obtained from this study.

#### 4.3.2.4 Effect Size

The aforementioned limitations of many of the methods for assessing the statistical significance of the effectiveness of interventions within SCED studies have led to a change in emphasis from hypothesis testing and the search for statistically significant p levels to the identification of practical significance through magnitude-of-effect measures e.g. effect sizes (Kirk, 1996; Shaver, 1991). Indeed, Cohen, Manion & Morrisson (2007) suggest that statistical significance alone is an unacceptable measure of effect. Practical significance, in contrast, is considered to be a more appropriate measure of effectiveness in SCED studies whereby participant improvement is the primary aim (Brossart et al, 2006). For a practically significant change to be noted, a minimal intervention

must be judged by the clinician or teacher, to have led to a large change in the participant's behaviour (Brossart et al, 2006; Prentice & Miller, 1992).

As a consequence of this change in emphasis, effect size is now widely recommended (Cohen, 1990; Kupfersmid, 1988; Rosnow & Rosenthal, 1989) and is considered to be the obvious choice for analysing SCED data (Busk & Serlin, 1992).

In their paper, Parker et al (2005) concluded that effect sizes offer advantages over other forms of statistical analyses for providing a summary of behaviour change across phases as they focus on the extent to which a response variable can be explained, predicted and controlled by the intervention (Carver, 1978; Mitchell & Hartmann, 1981; Rosnow & Rosenthal, 1989). Providing the study design possesses high internal validity, an effect size index can also offer a measure of treatment success and importantly they are only indirectly affected by the small sample sizes that are common in single case research (Parker et al, 2005).

Recognition of these advantages has led to an increase in reporting of effect sizes in published psychological research (Dar, Serlin & Omer, 1994) and in particular in the use of Cohen's d, r, and $R^2$ (Cohen, 1988). Cohen's d is the most widely employed method within the empirical literature (Cohen et al, 2007) and is therefore likely to provide enhanced comparability with other research studies and contribute to meta-analyses. However, some commentators consider Cohen's r and $R^2$, the regression based measures of effect size, to be the best available measure for analysing single case data (Faith, Allison & Gorman, 1996). Whichever measure is utilised, Cohen (1988) has provided guidelines for interpreting effect sizes (see figure 4.4.1) that are widely accepted although he warns that the way in which trend is controlled can have an impact on the results, as can differences in the design, clients and intervention (Maxwell, Camp & Avery, 1981; Mitchell & Hartmann, 1981; Rosnow & Rosenthal, 1989). With these contextual issues in mind, statisticians (Fidler & Thompson, 2001) recommend that an index of reliability such as Confidence Intervals should be presented alongside effect size data.

In a recent paper comparing alternative measures of effect size for use with SCEDs, Olive & Smith (2010) concluded that calculating effect size on the standard mean difference (as described by Busk & Serlin, 1992) was preferable to the use of regression equations.

## 4.4. Methods of Data Analysis employed in the Current Study

Having considered the issues relating to the analysis of SCED data, the researcher has chosen to undertake both visual and statistical analyses.

### 4.4.1. Visual Analysis

The data obtained for each of the participants will first be presented graphically and analysed through an interpretation of the graphical attributes. As stated earlier (section 4.3.1), there are no formal decision rules for making visual judgements (Bloom & Fischer, 1982; Hojem & Ottenbacher, 1988; Wampold & Furlong, 1981; Wolery & Harris, 1982). For the purposes of this study the researcher will consider the components of mean shift, variability, level, slope and trend (see Figure 4.4.1.) which have been taken from previous studies involving visual analysis (Harbst, Ottenbacher & Harris, 1991; Hojem & Ottenbacher, 1988). PND calculations will not be undertaken as, whilst zero data are not present in the baseline, some of the behaviours were very low frequency and as such it was deemed that such a calculation would be inappropriate.

| | |
|---|---|
| **Level** | the abruptness of changes occurring between the last data point in one phase and the first data point in the next phase. Quantified by taking the last data point in one phase and the first data point in the next phase and dividing the larger number by the smaller number. |
| **Trend** | the stationary, accelerating or decelerating patterns within the data set. Quantified by calculating and drawing split-middle trend lines / celeration lines through the median values of the baseline phase and projecting the line into subsequent phases for comparison with the actual data. |
| **Slope** | the steepness, angle or pitch of the data path. Quantified by noting the slope values (y values) for each of the phases |
| **Variability** | the amount of spread / fluctuation in a set of data points. Quantified by noting the standard deviation values for each of the phases. |
| **Mean Shift** | the mean change from the baseline to the intervention phase. Quantified by dividing the difference between the mean values of adjacent phase by the mean value of the preceding phase. |

**Figure 4.4.1: Descriptions of the components of mean shift, variability, level, slope and trend used in the Visual Analysis**

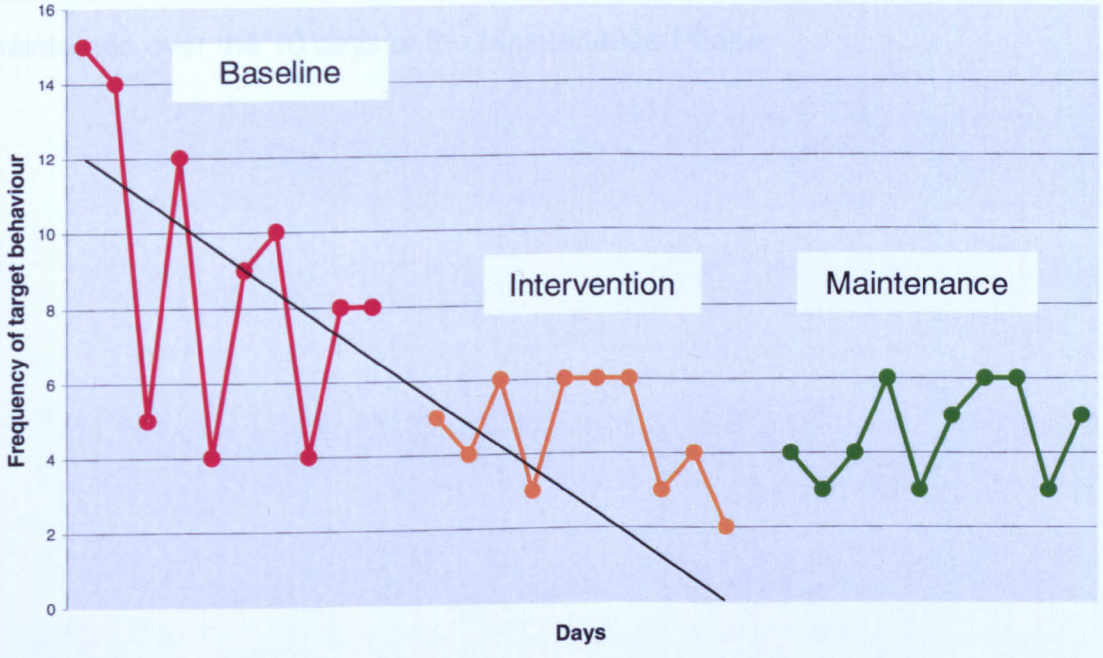
The graphs will be analysed by the researcher and another evaluator who holds a Doctorate in Applied Educational Psychology. Evaluators will be provided with the above descriptions of the visual components along with the necessary descriptive statistics e.g. slope values, standard deviations, mean values. They will then be asked to rate whether or not they believe there has been a practically significant change in performance across the phases on a 5 point scale (relating to the 5 components) ranging from 1 (strongly disagree) to 5 (strongly agree). A practically significant change will defined as one which has led to a large change in the participant's behaviour (Brossart et al, 2006; Prentice & Miller, 1992). Levels of inter-rater agreement will then be determined by calculating linearly weighted Cohen's Kappa coefficient (Cohen, 1968), a statistical measure of inter-rater reliability which is advocated for use with ordinal data obtained from rating scales with closed response categories. Fliess's (1981) 'rules of thumb' which suggest that scores of <.40 = poor, .40 – .75 are fair to good and > .75 are excellent, will be used to judges the level of inter-rater reliability.

### 4.4.2. Statistical Analysis

Effect Sizes will then be calculated to measure the magnitude of the intervention effect for each phase. The Cohen's d effect size will be calculated on the standard mean difference (as described by Busk & Serlin, 1992) as this has been found to be preferable to the use of regression equations for analysing SCED data (Olive & Smith, 2010) and is the most widely employed method within the empirical literature (Cohen et al, 2007) enhancing comparability with other research studies and contributing to meta-analyses. The Effect Sizes will then be assessed using Cohen's (1988) guidelines to identify practically significant changes in behaviour (Kirk, 1996; Shaver, 1991).

## 4.5. Data Analysis: Participant 1

### 4.5.1. Behaviour Log Data




**Graph 4.5.1.1. A line graph showing the frequency of the target behaviour 'not paying attention in class' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 1**

### Visual Analysis

| | |
|---|---|
| **Level** | there appears to have been a fairly abrupt change (1.6) between the final data point of the Baseline phase and the first data point of the Intervention phase. However there was a greater change between the Intervention and Maintenance phases (2). |
| **Trend** | the trend line reveals a decelerating pattern in the data points during the Baseline phase continuing at the outset of the Intervention phase before levelling off through to the Maintenance phase. |
| **Slope** | there is a steep decline in the data points during the Baseline phase (-0.67) that starts to flatten out into the Intervention (-0.2) and Maintenance phases (0.13). |
| **Variability** | there is considerable fluctuation in data points during the Baseline phase (sd 3.93), but the spread of data is more stable during the Intervention (sd 1.23) and Maintenance phases (sd 1.27). |
| **Mean Shift** | there was a large negative mean shift (-0.528) between the Baseline & Intervention phase with a more modest positive shift (0.074) between the Intervention and Maintenance phases. |

**Figure 4.5.1.1: Visual Analysis for Participant 1**

The visual analysis of Graph 4.5.1.1. suggests that whilst there was no abrupt change following the introduction of the Social Story, there was a decrease in the frequency of times the teaching assistant observed Participant 1 'not paying attention in class' from the Baseline to the Intervention phase and that this was maintained over the 10 days of the Maintenance Phase.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.5.1.2. for descriptive statistics and Table 4.5.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 8.9 | 3.92853 | 6.0897 | 11.7103 |
| Intervention | 10 | 4.2 | 1.22927 | 3.3206 | 5.0794 |
| Maintenance | 10 | 4.5 | 1.26930 | 3.5920 | 5.4080 |

**Table 4.5.1.2: A table providing descriptive statistics for the frequency data for Participant 1 for Baseline, Intervention & Maintenance phases**

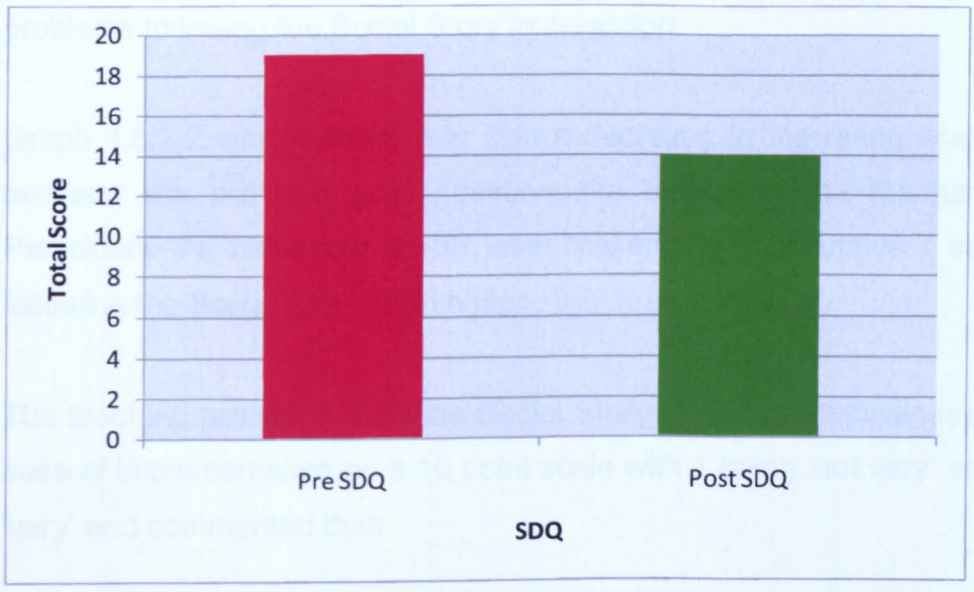
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.61 (0.65 to 2.58) |
| Intervention – Maintenance | -0.24 (-0.96 to 0.48) |

**Table 4.5.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

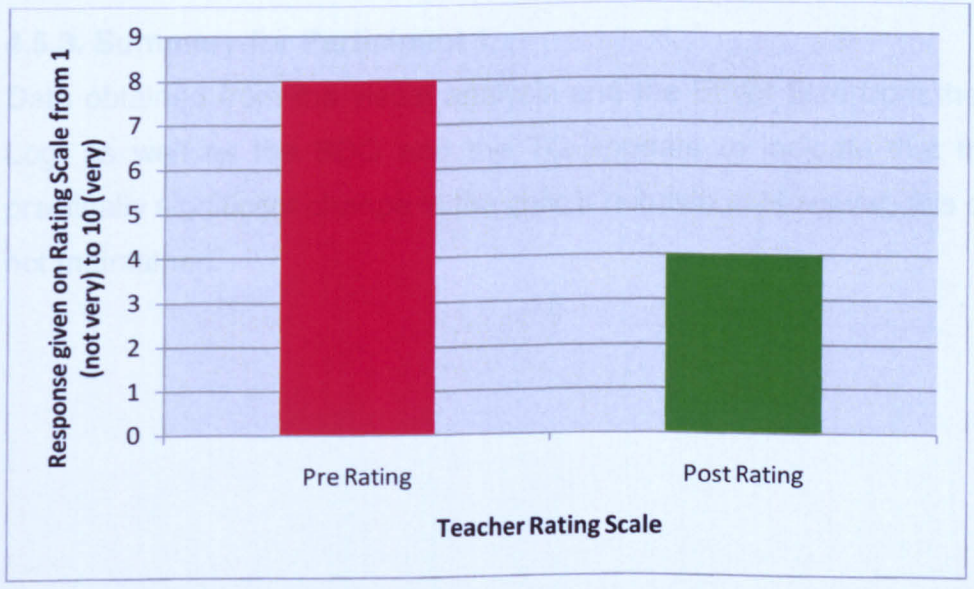
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.61** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.65 to 2.58. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of -0.24** between the Intervention and Maintenance phases suggests that there was a **'small'** negative treatment effect. However, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -0.96 to 0.48. As this range includes 0 we must acknowledge that the Effect Size could be 0 and as such the Effect Size of -0.24 could have been obtained by chance.

### 4.5.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.5.2.1. A bar chart showing the total scores obtained by Participant 1 on the pre and post SDQ**




**Graph 4.5.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.5.2.1. shows that there was a decrease in the total scores on the SDQ between the pre and post questionnaire indicating a decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.5.2.2. shows there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 1's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teaching assistant rated the Social Story at '**9**' for effectiveness and '**5**' for ease of implementation on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

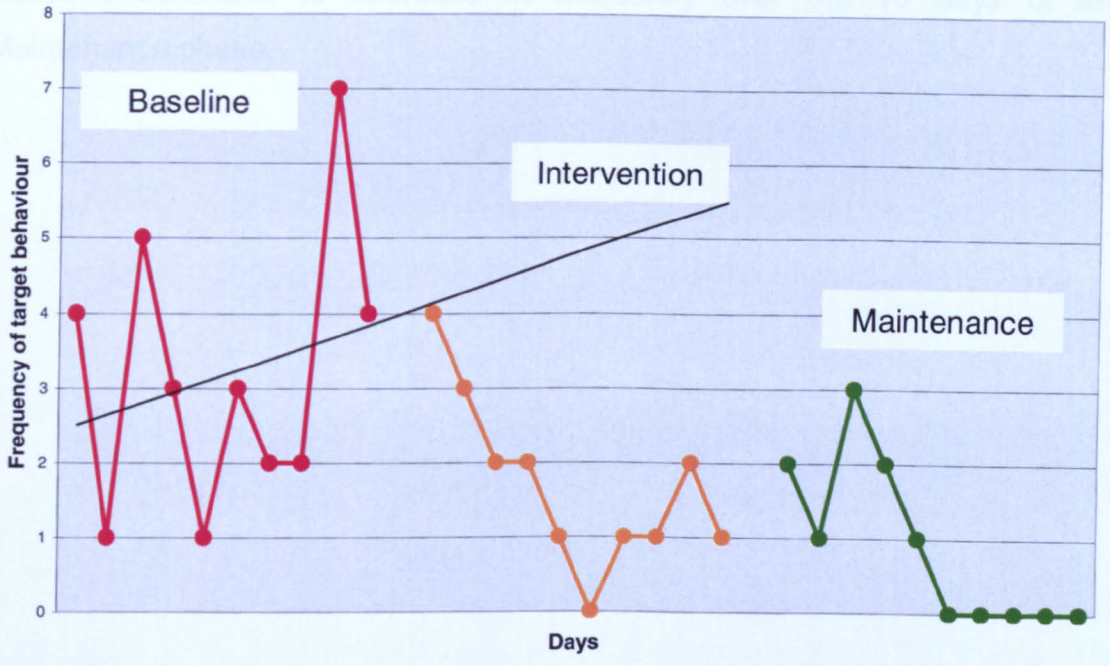
*"(Child's name) still needs prompting occasionally to listen to the adult giving instructions / teaching, however, he does appear to be a little more focused. Making it personal with photos made him more interested in reading it."*

### 4.5.3. Summary for Participant 1

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour. However, this change was not maintained.

## 4.6. Data Analysis: Participant 2

### 4.6.1. Behaviour Log Data




**Graph 4.6.1.1. A line graph showing the frequency of the target behaviour 'play-fighting at playtime' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 2**

### Visual Analysis

| | |
|---|---|
| **Level** | there does not appear to have been any change between the final data point of the Baseline and the first data point of the Intervention phase (0) but there was an abrupt change between the Intervention and Maintenance phases (2). |
| **Trend** | the trend line reveals an accelerating pattern during the Baseline phase which shifts to a decelerating pattern during the Intervention phase and continues through to the Maintenance phase before becoming static. |
| **Slope** | there is a shallow upward slope (0.16) during the Baseline phase before a steep decline in the data points during the Intervention phase (-0.26) that continues through into the Maintenance phase (-0.28). |
| **Variability** | there is considerable fluctuation in data points during the Baseline phase (sd 1.87) which continued during the Intervention phase (sd 1.86) but settled during the Maintenance phases (sd 1.1). |
| **Mean Shift** | there was a moderate negative mean shift (-0.47) between the Baseline & Intervention phases and between the intervention and maintenance phases (-0.47). |

**Figure 4.6.1.1: Visual Analysis for Participant 2**

The visual analysis of Graph 4.6.1.1. suggests that whilst there was a decrease in the frequency of times the teaching assistant observed Participant 2 'play-fighting at playtime' from the Baseline to the Intervention phase and these incidents continued to decrease in frequency over the 10 days of the Maintenance phase.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.6.1.2. for descriptive statistics and Table 4.6.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 3.2 | 1.87380 | 1.8596 | 4.5404 |
| Intervention | 10 | 1.7 | 1.15950 | 0.8705 | 2.5295 |
| Maintenance | 10 | 0.9000 | 1.10050 | 0.1127 | 1.6873 |

**Table 4.6.1.2: A table providing descriptive statistics for the frequency data for Participant 2 for Baseline, Intervention & Maintenance phases**

| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 0.96 (0.13 to 1.8) |
| Intervention – Maintenance | 0.58 (0 to 1.17) |

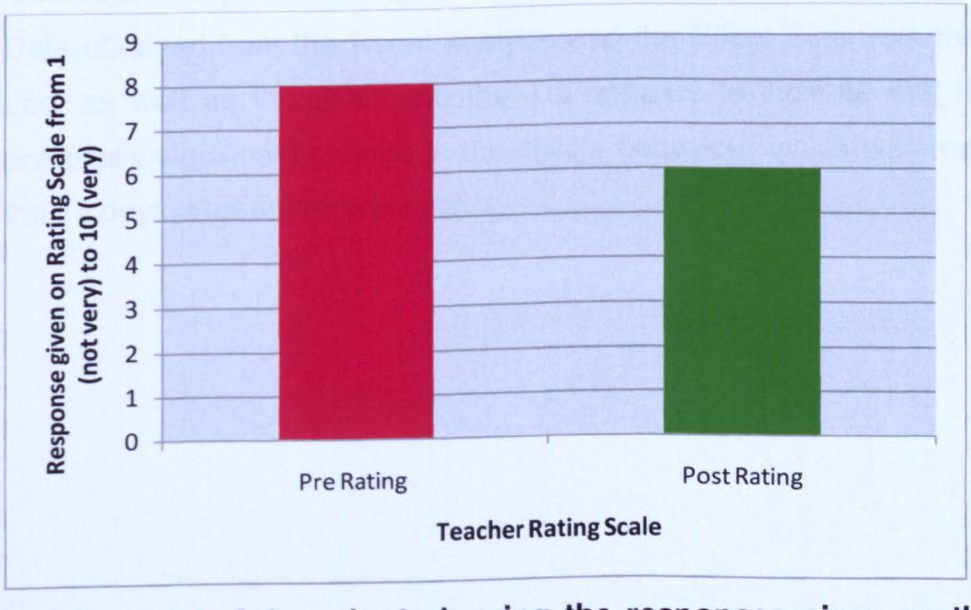
**Table 4.6.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 0.96** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.13 to 1.8. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 0.58** between the Intervention and Maintenance phases also suggests that there was a **'medium'** positive treatment effect. As the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0 to 1.17 and does not include 0 we can be reasonably certain that this positive change was also practically significant.

### 4.6.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data


**Graph 4.6.2.1. A bar chart showing the total scores obtained by Participant 2 on the pre and post SDQ**




**Graph 4.6.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.6.2.1. shows that there was a decrease in the total scores on the SDQ between the pre and post questionnaire indicating a decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.6.2.2. shows that there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 2's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**7**' for effectiveness and '**8**' for ease of implementation on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

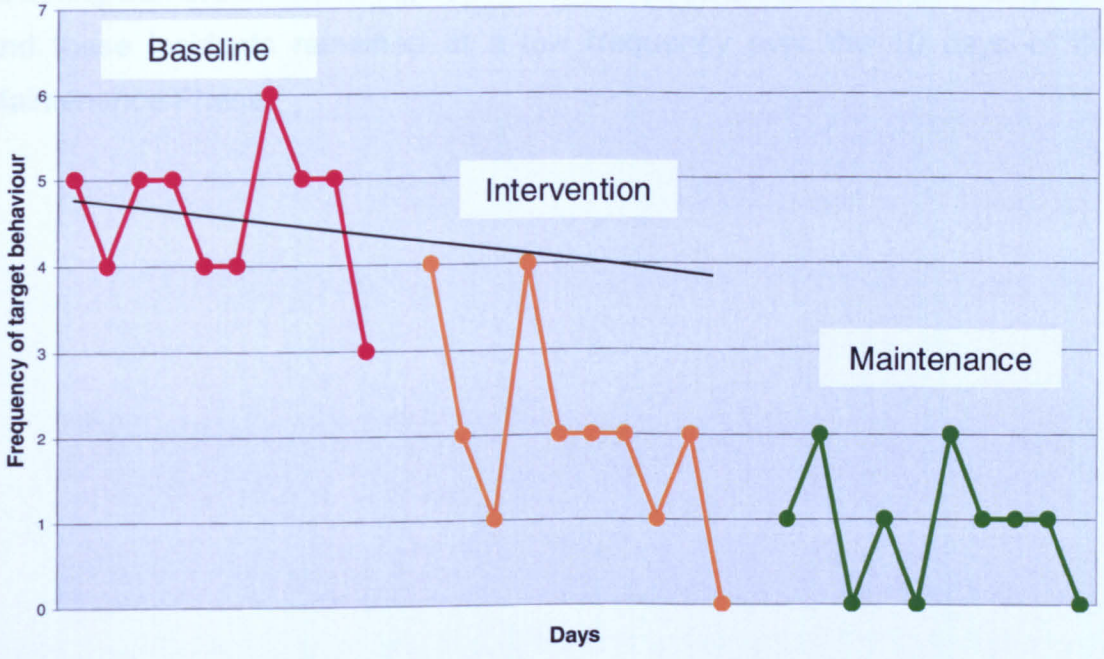
*"(Child's name) understood the story and his behaviour started to improve but he did start to go backwards when we first started reading the story less often."*

### 4.6.3. Summary for Participant 2

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention.

## 4.7. Data Analysis: Participant 3

### 4.7.1. Behaviour Log Data




**Graph 4.7.1.1. A line graph showing the frequency of the target behaviour 'not following instructions for lining up' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 3**

### Visual Analysis

| | |
|---|---|
| **Level** | there appears to have been a fairly abrupt change between the final data point of the Baseline and the first data point of the Intervention phase (1.33), with a smaller change between the Intervention and Maintenance phases (1). |
| **Trend** | the trend line reveals a relatively static pattern in the data points during the Baseline phase. There is then a decelerating pattern during the Intervention phase that continues through to the Maintenance phase before becoming static again. |
| **Slope** | there is a very shallow downward slope (-0.05) during the Baseline phase before a steep decline in the data points during the Intervention phase (-0.25) that flattens of during the Maintenance phase (-0.005). |
| **Variability** | there is some limited fluctuation in data points during the Baseline phase (0.84) which increases following the introduction of the Intervention (1.25). The spread of data becomes more stable again during the Maintenance phase (0.74). |
| **Mean Shift** | there was a large negative mean shift (-0.57) between the Baseline & Intervention phases and between the intervention and maintenance phases (-0.55). |

**Figure 4.7.1.1: Visual Analysis for Participant 3**

The visual analysis of Graph 4.7.1.1. suggests that whilst there was no abrupt change following the introduction of the Social Story, there was a decrease in the frequency of times the teaching assistant observed Participant 3 'not following instructions for lining up' from the Baseline to the Intervention phase and these incidents remained at a low frequency over the 10 days of the Maintenance Phase.

**Statistical Analysis**

An Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.7.1.2. for descriptive statistics and Table 4.7.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 4.6 | 0.84327 | 3.9968 | 5.2032 |
| Intervention | 10 | 2.00 | 1.24722 | 1.1078 | 2.8922 |
| Maintenance | 10 | 0.900 | 0.73786 | 0.3722 | 1.4278 |

**Table 4.7.1.2: A table providing descriptive statistics for the frequency data for Participant 3 for Baseline, Intervention & Maintenance phases**

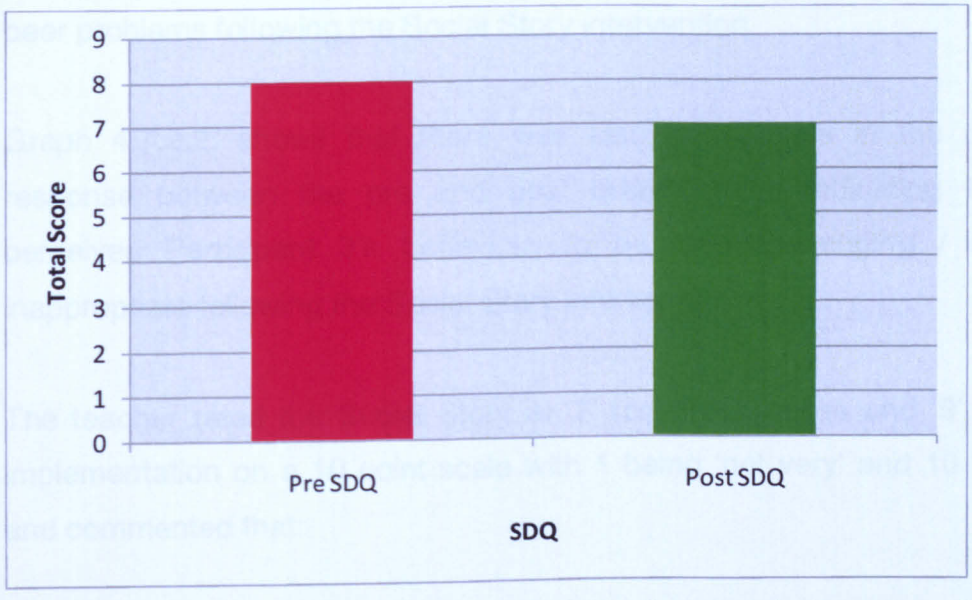
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 2.44 (1.87 to 3.01) |
| Intervention – Maintenance | 1.07 (0.20 to 1.94) |

**Table 4.7.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

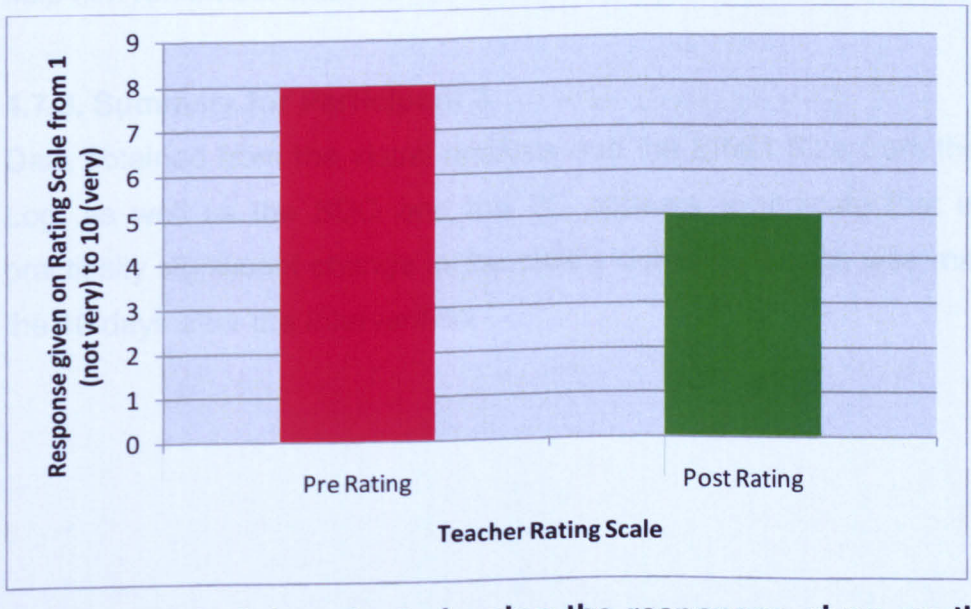
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 2.44** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 1.87 to 3.01. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 1.07** between the Intervention and Maintenance phases suggests that this **'large'** positive treatment effect carried over into the Maintenance phase. As the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.20 to 1.94 and does not include 0 we can be reasonably certain that this positive change was also practically significant.

### 4.7.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.7.2.1. A bar chart showing the total scores obtained by Participant 3 on the pre and post SDQ**




**Graph 4.7.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.7.2.1. shows that there was a small decrease in the total scores on the SDQ between the pre and post questionnaire indicating a slight decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.7.2.2. shows that there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 3's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**7**' for effectiveness and '**9**' for ease of implementation on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

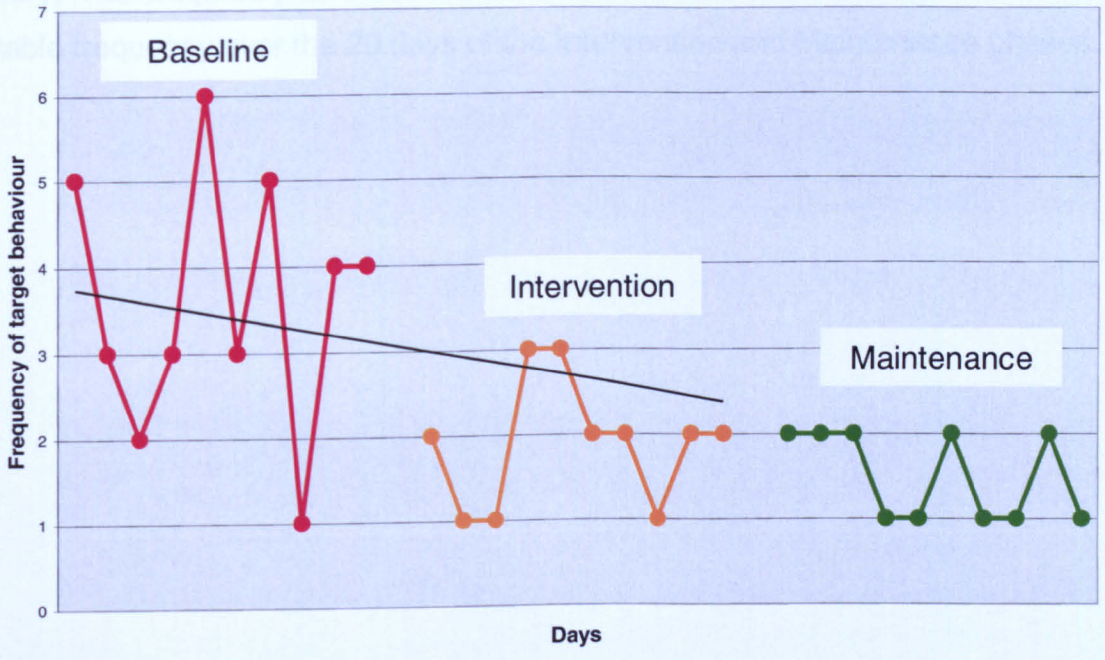
*"Although (Child's name) is much better at lining up now, he still needs reminding at times. I feel the Social Story could be used on a regular basis to help him remember what he has to do."*

### 4.7.3. Summary for Participant 3

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention.

## 4.8. Data Analysis: Participant 4

### 4.8.1. Behaviour Log Data




**Graph 4.8.1.1. A line graph showing the frequency of the target behaviour 'getting upset if not the first to answer' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 4**

### Visual Analysis

| | |
|---|---|
| **Level** | there is an abrupt change between the final data point of the Baseline phase and the first data point of the Intervention phase (2) but not between the Intervention and Maintenance phase (0). |
| **Trend** | the trend line reveals an initially decelerating trend in the Baseline phase before it becomes increasingly static during the Intervention and Maintenance phases. |
| **Slope** | there is a shallow downward slope during the Baseline phase (-0.24) before the data begins to level off during the Intervention phase (0.02). There is then a slight downward slope during the Maintenance phase (-0.08). |
| **Variability** | there is considerable fluctuation in data points during the Baseline phase (sd 1.5), but the spread of data becomes more stable during the Intervention (sd 0.74) and Maintenance phases (sd 0.53) |
| **Mean Shift** | there was a negative mean shift (-0.47) between the Baseline & Intervention phases and between the intervention and maintenance phases (-0.21). |

**Figure 4.8.1.1: Visual Analysis for Participant 4**

The visual analysis of Graph 4.8.1.1. appears to show that there was an abrupt change in the frequency of times the teaching assistant observed Participant 4 "getting upset if not the first to answer" following the introduction of the Social Story. The frequency of these incidents then remained at a lower and more stable frequency over the 20 days of the Intervention and Maintenance phases.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.8.1.2. for descriptive statistics and Table 4.8.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 3.6 | 1.50555 | 2.5230 | 4.6770 |
| Intervention | 10 | 1.9 | 0.73786 | 1.3722 | 2.4278 |
| Maintenance | 10 | 1.5 | 0.52705 | 1.1230 | 1.8770 |

**Table 4.8.1.2: A table providing descriptive statistics for the frequency data for Participant 4 for Baseline, Intervention & Maintenance phases**

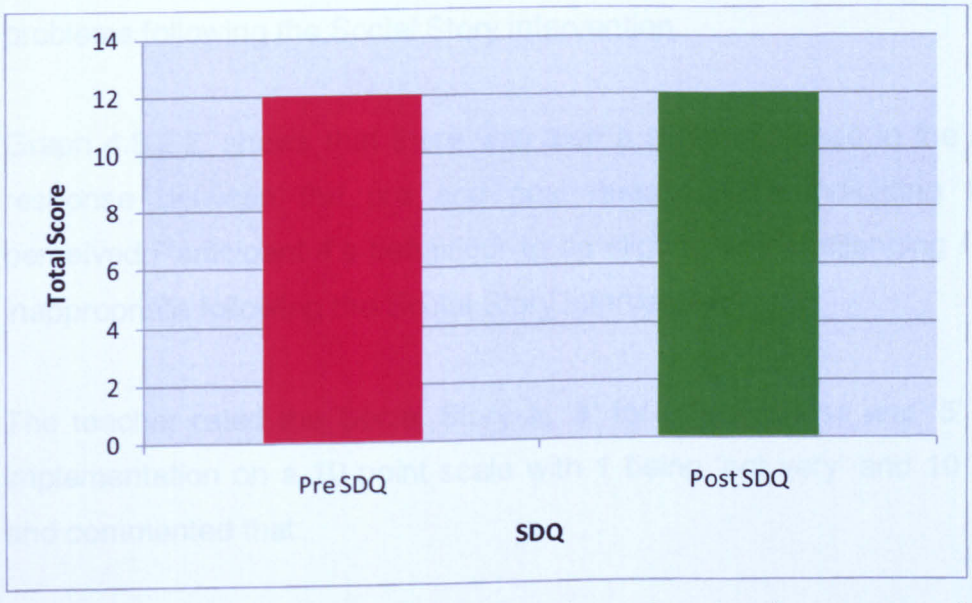
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.43 (0.52 to 2.34) |
| Intervention – Maintenance | 0.62 (-0.2 to 1.45) |

**Table 4.8.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

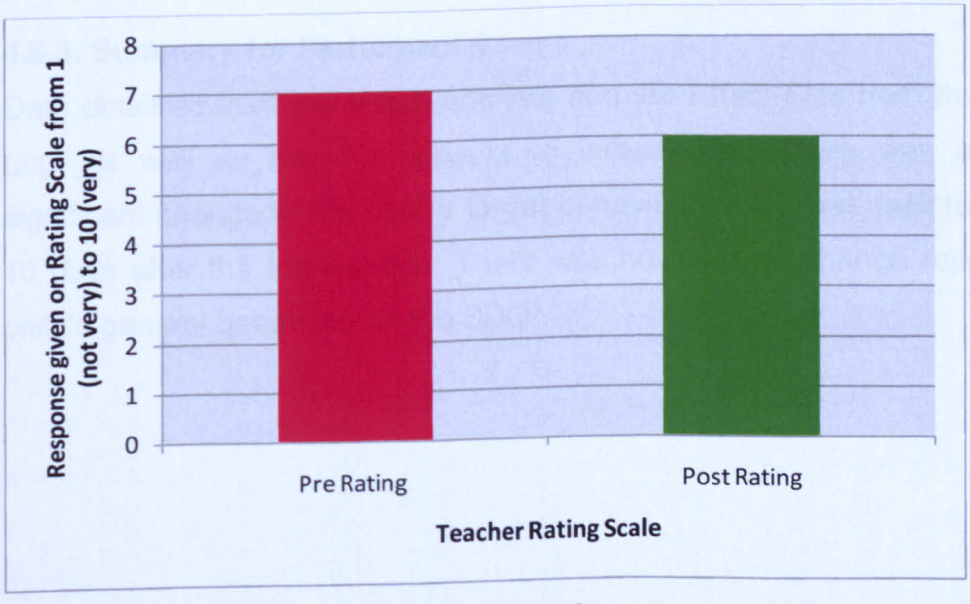
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.43** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.52 to 2.34. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 0.62** between the Intervention and Maintenance phases also suggests that there was a **'medium'** positive treatment effect. However, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -0.2 to 1.45. As this range includes 0 we must acknowledge that the Effect Size could be 0 and as such the Effect Size of 0.62 could have been obtained by chance.

### 4.8.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.8.2.1. A bar chart showing the total scores obtained by Participant 4 on the pre and post SDQ**




**Graph 4.8.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.8.2.1. shows that there was no change in the total scores on the SDQ between the pre and post questionnaire indicating no change in any difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.8.2.2. shows that there was also a slight decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 4's behaviour to be slightly less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**8**' for effectiveness and '**5**' for ease of implementation on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

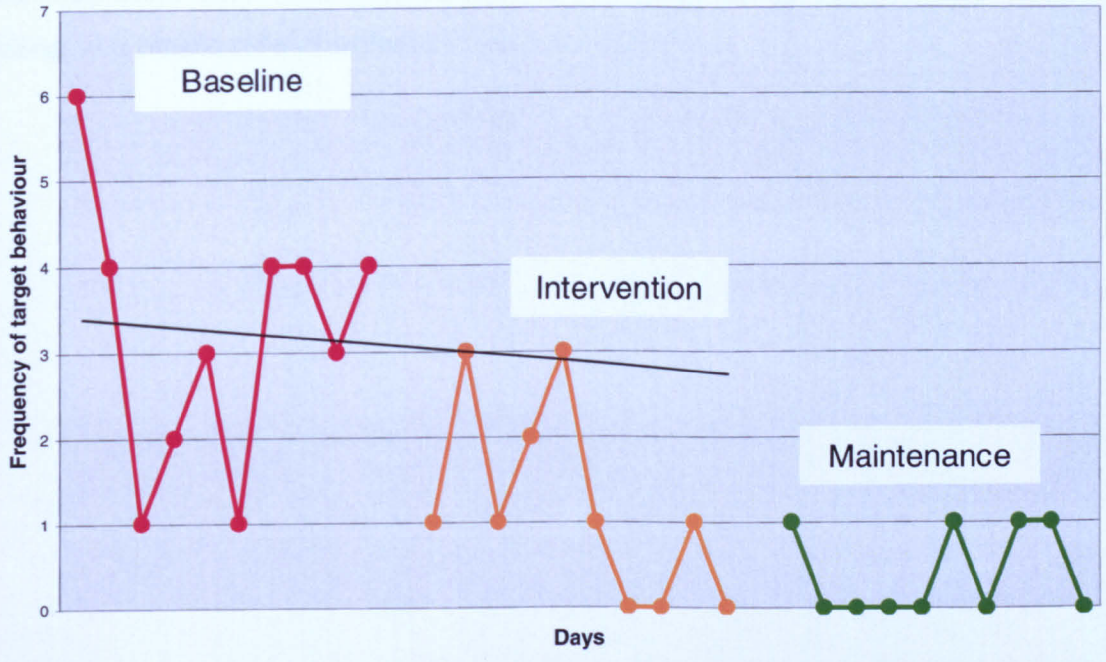
*"Taking turns has improved. (Child's name) can now cope with not being the first to answer and knows that if I say 'no' or 'now is not the time to talk to me' that I need him to stop and he responds and stops."*

### 4.8.3. Summary for Participant 4

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the TQ appears to indicate that there was a practically significant change in the child's target behaviour which was maintained for the 10 days after the Intervention. There was however no change reported in the child's general behaviour on the SDQ.

## 4.9. Data Analysis: Participant 5

### 4.9.1. Behaviour Log Data




**Graph 4.9.1.1. A line graph showing the frequency of the target behaviour 'forgetting belongings' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 5**

### Visual Analysis

| | |
|---|---|
| **Level** | there is an abrupt change between the final data point of the Baseline phase and the first data point of the Intervention phase (4) but only a small change between the Intervention and Maintenance phase (1). |
| **Trend** | the trend line reveals an initially decelerating trend followed by acceleration during the Baseline phase. The decelerating trend continues into the Intervention phase and the data points become increasingly static during the Maintenance phase. |
| **Slope** | there is a shallow downward slope during the Baseline phase (-0.04) which becomes steeper during the Intervention phase (-0.22). The data points then flatten off during the Maintenance phase (0.02). |
| **Variability** | there is considerable fluctuation in data points during the Baseline (sd 1.55) and Intervention phases (sd 1.14), but the spread of data becomes more stable during the Maintenance phase (sd 0.52). |
| **Mean Shift** | There was a large negative mean shift (-0.63) between the Baseline & Intervention phases and between the Intervention and Maintenance phases (-0.67). |

**Figure 4.9.1.1: Visual Analysis for Participant 5**

Visual Inspection of Graph 4.9.1.1. suggests that there was an abrupt decrease in the frequency of times the teaching assistant observed Participant 5 'forgetting belongings' from the Baseline to the Intervention phase. Furthermore, this decrease was maintained over the 10 days of the 'Maintenance Phase' falling to a stable rate of between 0 and 1 incidents.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.9.1.2. for descriptive statistics and Table 4.9.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 3.2 | 1.54919 | 2.0918 | 4.3082 |
| Intervention | 10 | 1.2 | 1.13529 | 0.3879 | 2.0121 |
| Maintenance | 10 | 0.4 | 0.51640 | 0.0306 | 0.7694 |

**Table 4.9.1.2: A table providing descriptive statistics for the frequency data for Participant 5 for Baseline, Intervention & Maintenance phases**

| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.44 (0.64 to 2.25) |
| Intervention – Maintenance | 0.91 (-0.01 to 1.83) |

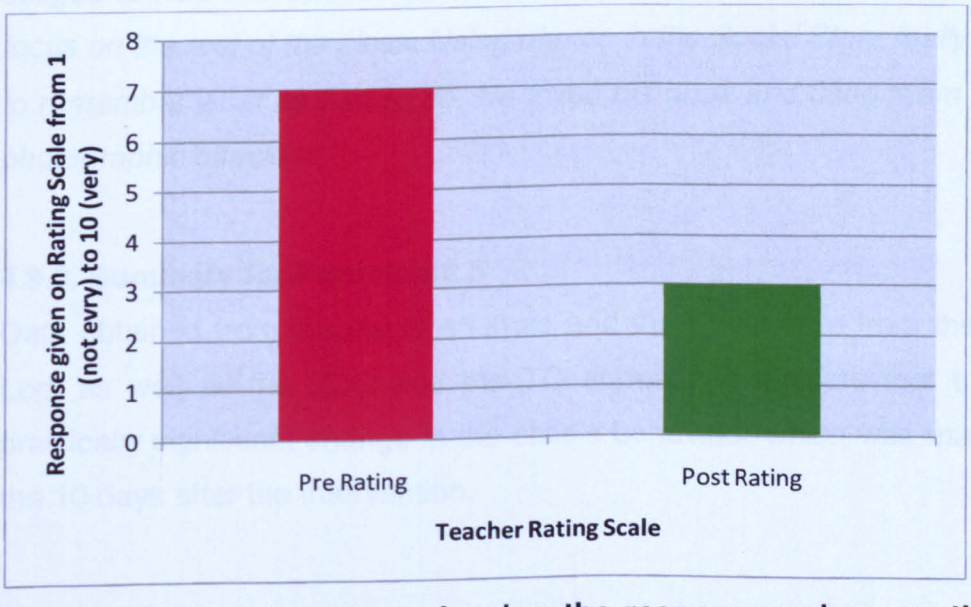
**Table 4.9.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.44** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.64 to 2.25. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 0.91** between the Intervention and Maintenance phases also suggests that there was a **'large'** positive treatment effect. However, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -0.01 to 1.83. As this range includes 0 we must acknowledge that the Effect Size could be 0 and as such the Effect Size of 0.91 could have been obtained by chance.

### 4.9.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data


**Graph 4.9.2.1. A bar chart showing the total scores obtained by Participant 5 on the pre and post SDQ**




**Graph 4.9.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.9.1.2 shows that there was a slight decrease in the total scores on the SDQ between the pre and post questionnaire indicating a slight decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.9.2.2. shows that there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 5's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**8**' for effectiveness and '**10**' for ease of implementation on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

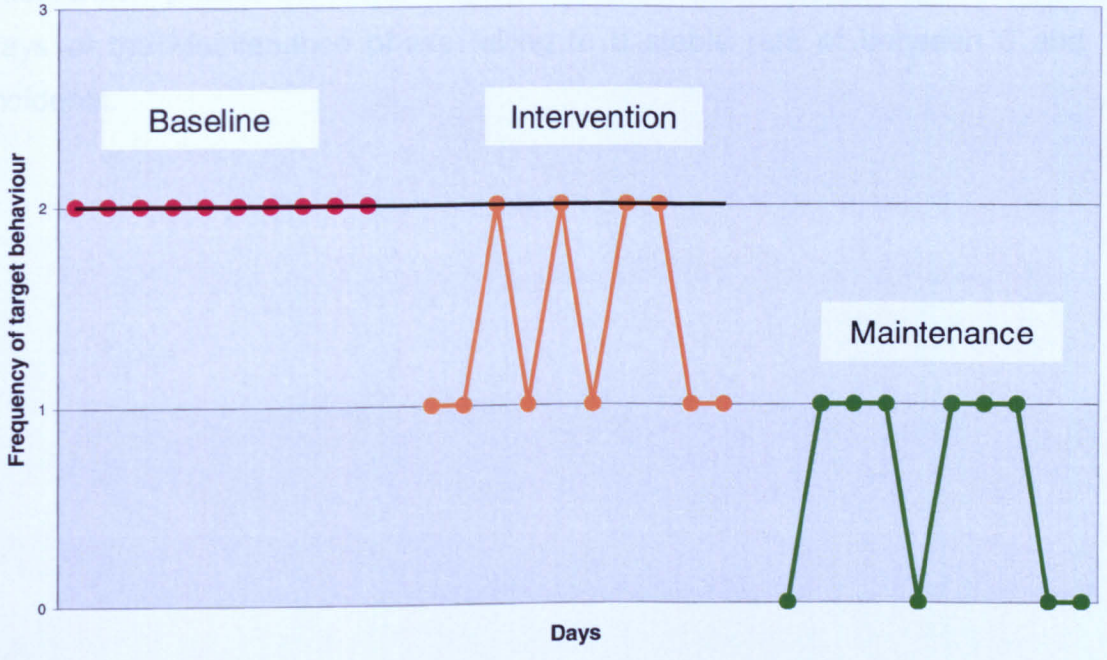
*"(Child's name) is now much better at organising himself at the start of the day.. It has also benefited the other children that sit on his table as they are no longer obliged to help him and his teacher and I rarely have to prompt him so we can focus on the rest of the class. Using photos in the Social Story really helped him to remember what he had to do. He loved his book and used them as a sort of photographic checklist."*

**4.9.3. Summary for Participant 5**

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention.

## 4.10. Data Analysis: Participant 6

### 4.10.1. Behaviour Log Data




**Graph 4.10.1.1. A line graph showing the frequency of the target behaviour 'getting upset about playtime' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 6**

### Visual Analysis

| | |
|---|---|
| **Level** | there was a small but fairly abrupt change between the final data point of the Baseline phase and the first of the Intervention phase (1) and the same pattern occurred between the Intervention and Maintenance phases (1). |
| **Trend** | the trend line highlights the static data points during the Baseline. Data points then become increasingly scattered throughout the Intervention and Maintenance phases. |
| **Slope** | the data is flat during the Baseline phase with a slight downward slope during the Intervention phase (-0.01) which steepens during the Maintenance phase (-0.04). |
| **Variability** | there is a completely stable Baseline rate (0) with some fluctuation in data points during the Intervention (0.52) and Maintenance phases (0.52). |
| **Mean Shift** | there was a small negative mean shift (-0.3) between the Baseline & Intervention phases and between the Intervention and Maintenance phases (-0.57). |

**Figure 4.10.1.1: Visual Analysis for Participant 6**

Visual Inspection of Graph 4.10.1.1. suggests that following a stable Baseline rate, there was a decrease in the frequency of times the teaching assistant observed Participant 6 'getting upset about playtime' from the Baseline to the Intervention phase. Furthermore, this decrease was maintained over the 10 days of the Maintenance phase falling to a stable rate of between 0 and 1 incidents.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.10.1.2. for descriptive statistics and Table 4.10.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 2 | 0 | 2 | 2 |
| Intervention | 10 | 1.4 | 0.51640 | 1.0306 | 1.7694 |
| Maintenance | 10 | 0.6 | 0.51640 | 0.2306 | 0.9694 |

**Table 4.10.1.2: A table providing descriptive statistics for the frequency data for Participant 6 for Baseline, Intervention & Maintenance phases**

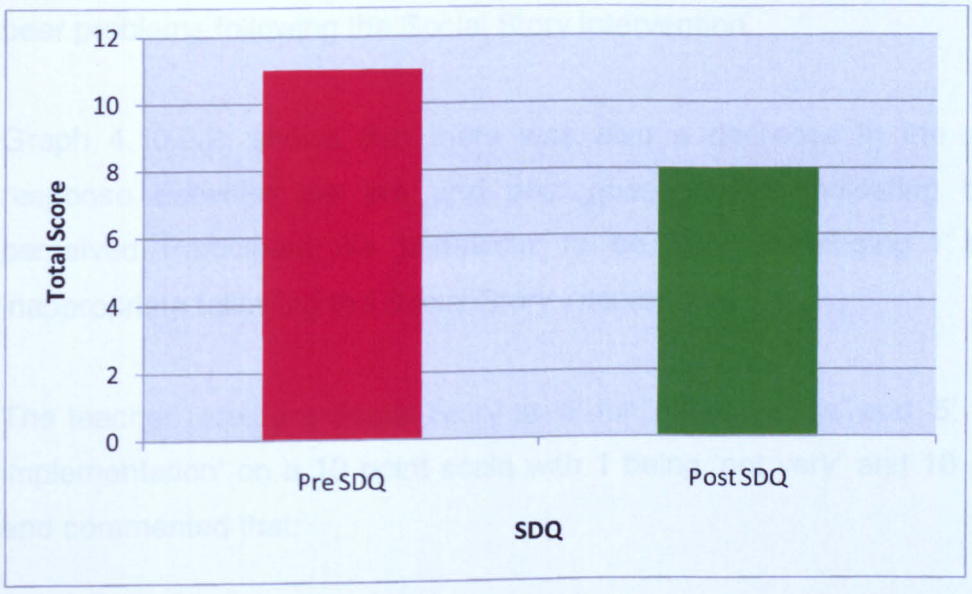
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.64 (1.64 to 1.64) |
| Intervention – Maintenance | 1.55 (0.83 to 2.27) |

**Table 4.10.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

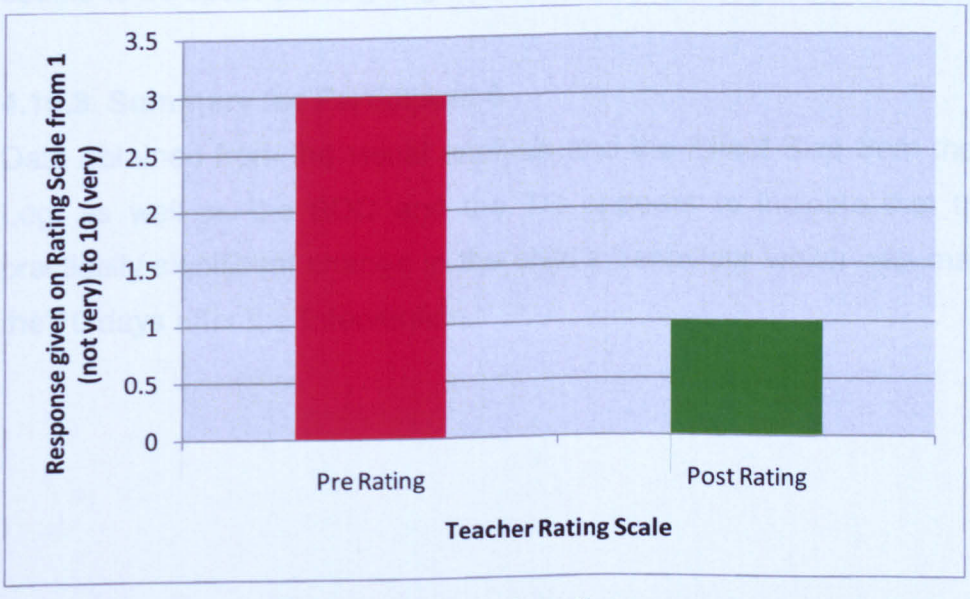
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.64** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 1.64 to 1.64. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's Effect Size of 1.55** between the Intervention and Maintenance phases also suggests that there was a **'large'** positive treatment effect. As the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.88 to 2.27 and does not include 0 we can be reasonably certain that this positive change was also practically significant.

### 4.10.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.10.2.1. A bar chart showing the total scores obtained by Participant 6 on the pre and post SDQ**




**Graph 4.10.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.10.2.1. shows that there was a slight decrease in the total scores on the SDQ between the pre and post questionnaire indicating a slight decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.10.2.2. shows that there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 6's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**6**' for 'effectiveness' and '**5**' for 'ease of implementation' on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

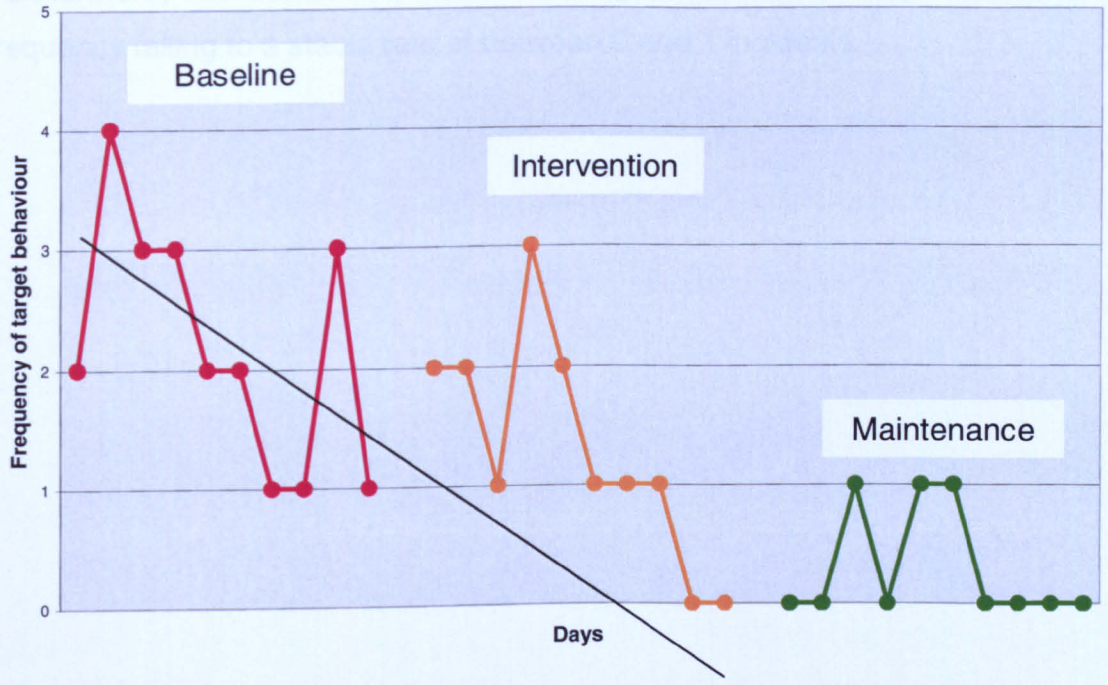
*"(Child's name) will now use a 'thumbs up' sign after playtimes and lunchtimes so we know when there are problems we need to chat about. He rarely ever seems to be upset about going outside anymore."*

### 4.10.3. Summary for Participant 6

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention.

## 4.11. Data Analysis: Participant 7

### 4.11.1. Behaviour Log Data




**Graph 4.11.1.1. A line graph showing the frequency of the target behaviour 'getting upset about being looked at' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 7**

### Visual Analysis

| | |
|---|---|
| **Level** | there was an abrupt change between the final data point of the Baseline and Intervention phase (2), with a smaller change occurring between the Intervention and Maintenance phases (0). |
| **Trend** | : the trend line reveals a decelerating pattern in the data points during the Baseline phase continuing at the outset of the Intervention phase before levelling off through to the Maintenance phase. |
| **Slope** | there is a steep decline in the data points during the Baseline phase (-0.19) that continues into the Intervention phase (-0.2) before flattening of during the Maintenance phase (-0.03). |
| **Variability** | :there is some fluctuation in data points during the Baseline phase (sd 1.03), but the spread of data becomes increasingly stable during the Intervention (sd 0.95) and Maintenance phases (sd 0.49). |
| **Mean Shift** | there was a moderate negative mean shift (-0.41) between the Baseline & Intervention phase with a larger shift (-0.77) occurring between the Intervention and Maintenance phases. |

**Figure 4.11.1.1: Visual Analysis for Participant 7**

Visual Inspection of Graph 4.11.1.1. highlights that there was a decrease in the frequency of times the teaching assistant observed Participant 7 'getting upset about being looked at' from the Baseline to the Intervention phase. Furthermore, this decrease continued during the Maintenance phase with the frequency falling to a stable rate of between 0 and 1 incidents.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.11.1.2. for descriptive statistics and Table 4.11.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 2.2 | 1.03280 | 1.4612 | 2.9388 |
| Intervention | 10 | 1.3 | 0.94868 | 0.6214 | 1.9786 |
| Maintenance | 10 | 0.3 | 0.48305 | -0.0456 | 0.6456 |

**Table 4.11.1.2: A table providing descriptive statistics for the frequency data for Participant 7 for Baseline, Intervention & Maintenance phases**

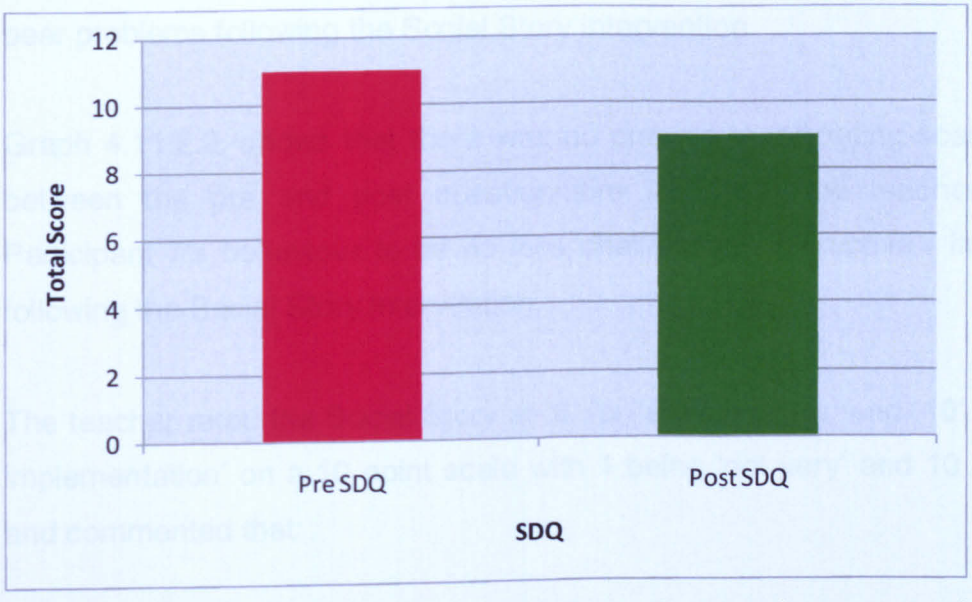
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 0.91 (0.16 to 1.65) |
| Intervention – Maintenance | 1.33 (0.43 to 2.23) |

**Table 4.11.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

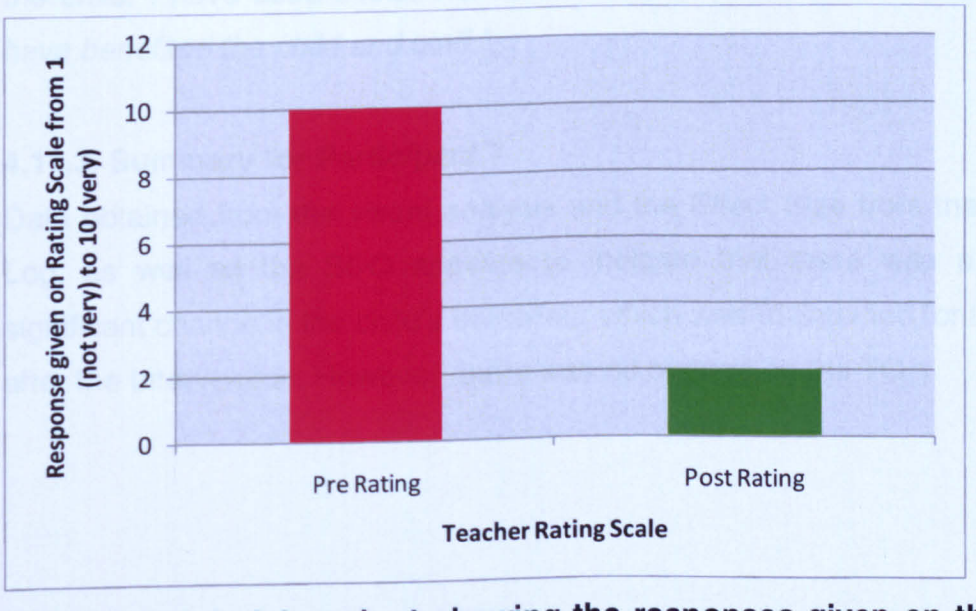
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 0.91** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.16 to 1.65. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 1.33** between the Intervention and Maintenance phases suggests that this **'large'** positive treatment effect carried over into the Maintenance phase. As the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.43 to 2.23 and does not include 0 we can be reasonably certain that this positive change was also practically significant.

### 4.11.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.11.2.1. A bar chart showing the total scores obtained by Participant 7 on the pre and post SDQ**




**Graph 4.11.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.11.2.1. shows that there was a decrease in the total scores on the SDQ between the pre and post questionnaire indicating a decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.11.2.2. shows that there was no change in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 7's behaviour to be no less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**8**' for 'effectiveness' and '**10**' for 'ease of implementation' on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

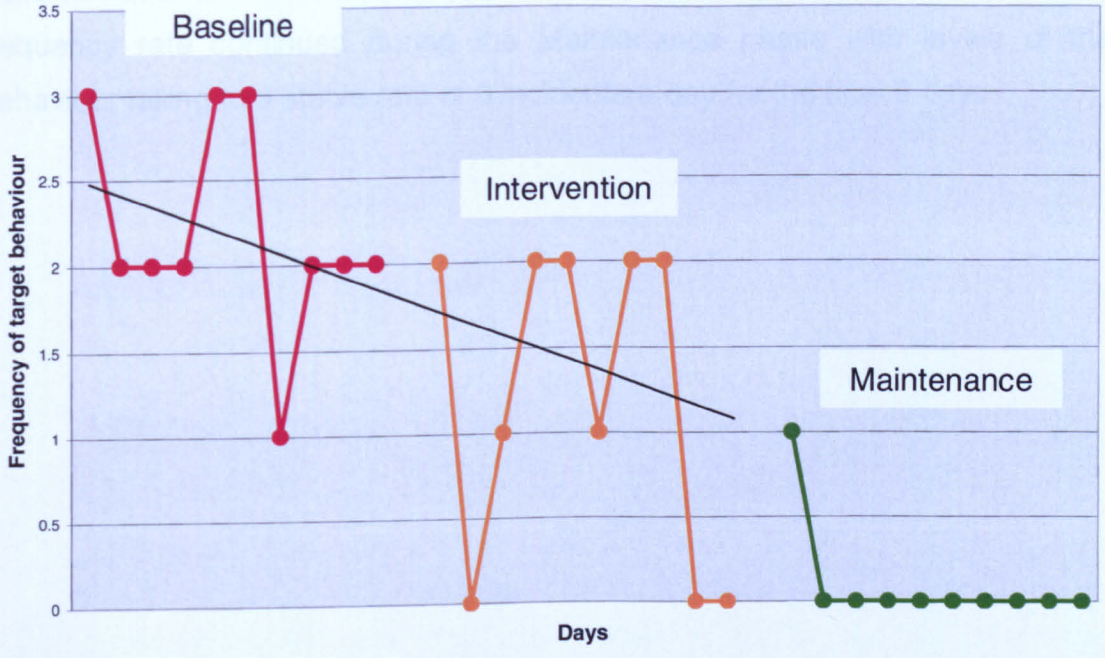
*"He is now able to calm down and 'move on' much quicker when reminded of the Social Story. It is a quick strategy which is less disruptive to the class and the child. I have used social stories on many occasions and always feel they have benefited the child and staff."*

### 4.11.3. Summary for Participant 7

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention. However, there was no change on the TQ.

## 4.12. Data Analysis: Participant 8

### 4.12.1. Behaviour Log Data




**Graph 4.12.1.1. A line graph showing the frequency of the target behaviour 'leaving the classroom during lessons' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 8**

### Visual Analysis

| | |
|---|---|
| **Level** | there is no abrupt change between the final data point of the Baseline phase and the first point of the Intervention phase (0) with a small change occurring between the Intervention and Maintenance phases (1). |
| **Trend** | the trend line reveals a decelerating pattern in the data points during the Baseline phase continuing at the outset of the Intervention phase before levelling off through to the Maintenance phase. |
| **Slope** | there is a shallow decline in the data points during the Baseline phase (-0.07) that continues into the Intervention phase (-0.08) before flattening of during the Maintenance phase (-0.05). |
| **Variability** | there is some fluctuation in data points during the Baseline phase (sd 0.63), which increases during the Intervention phase (sd 0.92) before becoming more stable during the Maintenance phase (sd 0.32). |
| **Mean Shift** | there was a moderate negative mean shift (-0.45) between the Baseline & Intervention phase with a larger shift (-0.92) occurring between the Intervention and Maintenance phases. |

**Figure 4.12.1.1: Visual Analysis for Participant 8**

Visual Inspection of Graph 4.12.1.1. highlights that there was a decrease in the frequency of times the teaching assistant observed Participant 8 'leaving the classroom during lessons' from the Baseline to the Intervention phase although trend remains curvilinear and there is considerable variability. The decreased frequency rate continued during the Maintenance phase with levels of the behaviour falling to a stable rate of 0 incidents a day for the final 9 days.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.12.1.2. for descriptive statistics and Table 4.12.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 2.2 | 0.63246 | 1.7476 | 2.6524 |
| Intervention | 10 | 1.2 | 0.91894 | 0.5426 | 1.8574 |
| Maintenance | 10 | 0.1 | 0.31623 | -0.1262 | 0.3263 |

**Table 4.12.1.2: A table providing descriptive statistics for the frequency data for Participant 8 for Baseline, Intervention & Maintenance phases**

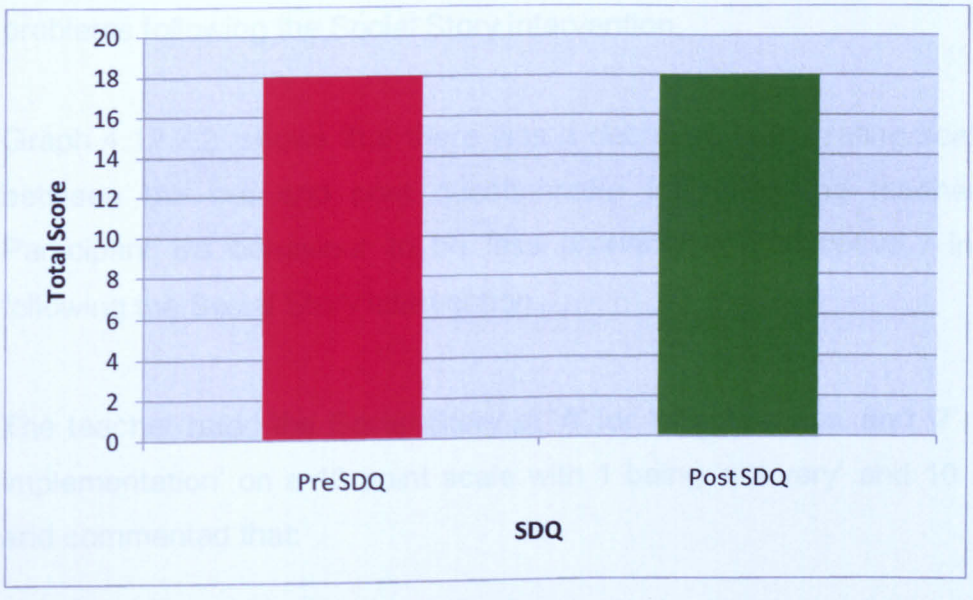
| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.27 (0.70 to 1.84) |
| Intervention – Maintenance | 1.6 (0.64 to 2.56) |

**Table 4.12.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

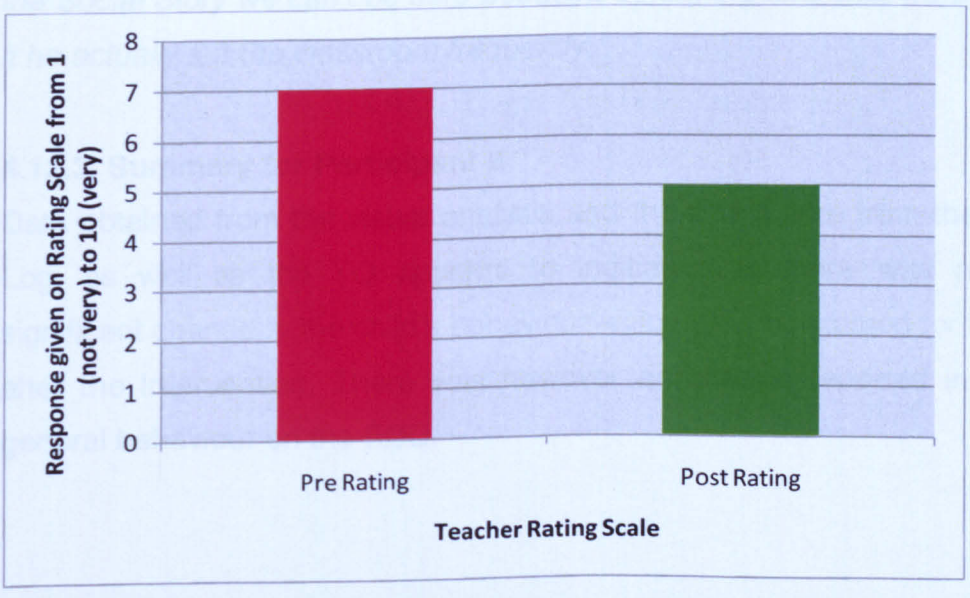
When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.27** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.70 to 1.84. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of 1.6** between the Intervention and Maintenance phases suggests that this **'large'** positive treatment effect carried over into the Maintenance phase. As the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.64 to 2.56 and does not include 0 we can be reasonably certain that this positive change was also practically significant.

### 4.12.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.12.2.1. A bar chart showing the total scores obtained by Participant 8 on the pre and post SDQ**




**Graph 4.12.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.12.2.1. shows that there was no change in the total scores on the SDQ between the pre and post questionnaire indicating no change in any difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.12.2.2. shows that there was a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 8's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**4**' for 'effectiveness' and '**7**' for 'ease of implementation' on a 10 point scale with 1 being 'not very' and 10 being 'very' and commented that:

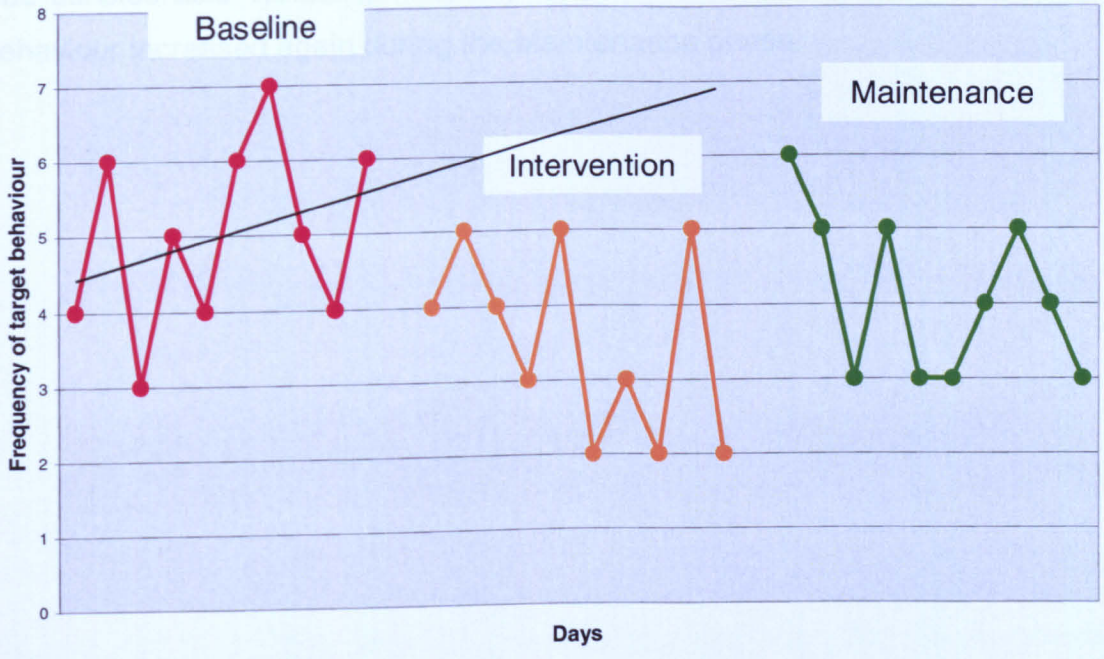
*"(Child's name)'s behaviour has been much better of late. Leaving the classroom isn't such an issue now as it has been. How much of this is down to the Social Story we can't be sure because during the time that we were reading it he actually left the classroom frequently."*

### 4.12.3. Summary for Participant 8

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the TQ appears to indicate that there was a practically significant change in the child's behaviour which was maintained for the 10 days after the Intervention. There was however no change reported in the child's general behaviour on the SDQ.

## 4.13. Data Analysis: Participant 9

### 4.13.1. Behaviour Log Data




**Graph 4.13.1.1. A line graph showing the frequency of the target behaviour 'not paying attention in class' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 9**

### Visual Analysis

| | |
|---|---|
| **Level** | there was a moderately abrupt change from the final data point of the Baseline phase to the first data point of the Intervention phase (1.5) and an even larger change between the Intervention and Maintenance phases (3). |
| **Trend** | : the trend line reveals that there was an accelerating trend during the Baseline phase. The data points then follow a decelerating trend during the Intervention phase before becoming more static during the Maintenance phase. |
| **Slope** | there is a shallow incline in the data points during the Baseline phase (0.133) before a shallow decline during the Intervention phase (-0.19) which continues into the Maintenance phase (-0.16). |
| **Variability** | there is some fluctuation in data points during the Baseline phase (sd 1.25), which continues during the Intervention (sd 1.27) and Maintenance phases (sd 1.1). |
| **Mean Shift** | there was a small negative mean shift (-0.3) between the Baseline & Intervention phase with a small positive mean shift (0.17) occurring between the Intervention and Maintenance phases. |

**Figure 4.13.1.1: Visual Analysis for Participant 9**

Visual Inspection of Graph 4.13.1.1. highlights that whilst there was a slight decline in the frequency of times the teaching assistant observed Participant 9 'not paying attention in class' from the Baseline to the Intervention phase there was considerable variability in data points. Furthermore, the frequency of the behaviour increased again during the Maintenance phase.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.13.1.2. for descriptive statistics and Table 4.13.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 5 | 1.24722 | 4.1078 | 8.8922 |
| Intervention | 10 | 3.5 | 1.26930 | 2.5920 | 4.4080 |
| Maintenance | 10 | 4.1 | 1.10050 | 3.3127 | 4.8873 |

**Table 4.13.1.2: A table providing descriptive statistics for the frequency data for Participant 9 for Baseline, Intervention & Maintenance phases**

| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 1.19 (0.48 to 4.28) |
| Intervention – Maintenance | -0.51 (-1.26 to 0.26) |

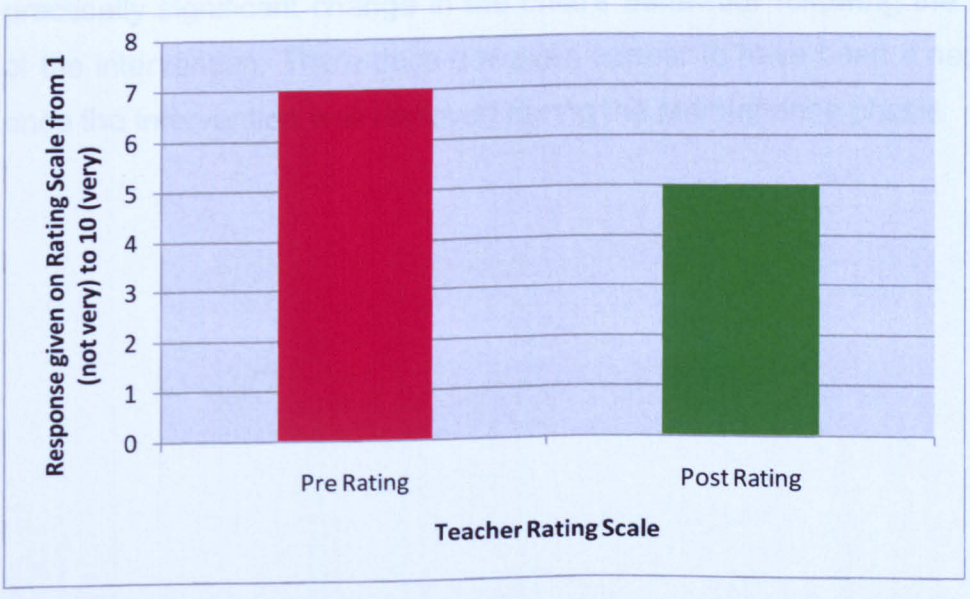
**Table 4.13.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 1.19** between the Baseline and Intervention phases suggests there was a **'large'** positive treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of 0.48 to 4.28. As this range does not include 0 we can be reasonably certain that a positive change was reported and a practically significant change occurred.

The **Cohen's d Effect Size of -0.51** between the Intervention and Maintenance phases suggests that there was a **'large'** negative treatment effect. However, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -1.26 to 0.26. As this range includes 0 we must acknowledge that the Effect Size could be 0 and as such the Effect Size of -0.51 could have been obtained by chance.

### 4.13.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data


**Graph 4.13.2.1. A bar chart showing the total scores obtained by Participant 9 on the pre and post SDQ**




**Graph 4.13.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.13.2.1. shows that there was a decrease in the total scores on the SDQ between the pre and post questionnaire indicating a decrease in difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.13.2..2. shows that there was also a decrease in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 9's behaviour to be less challenging / disruptive / inappropriate following the Social Story intervention.

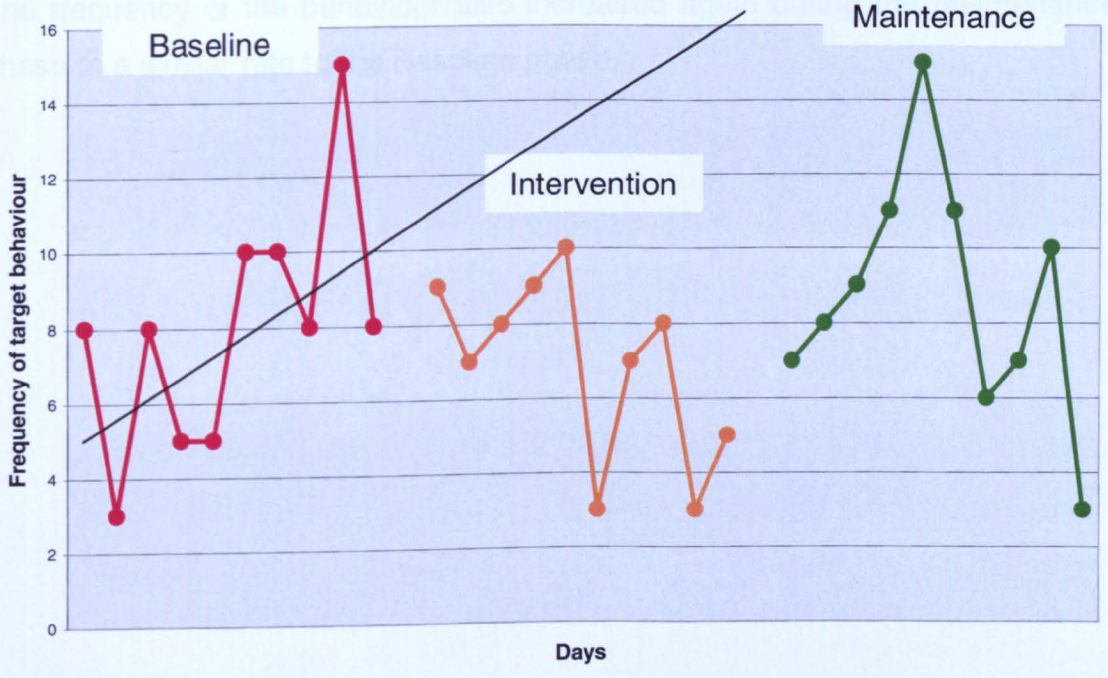
The teacher rated the Social Story at '**6**' for 'effectiveness' and '**7**' for 'ease of implementation' on a 10 point scale with 1 being 'not very' and 10 being 'very'.

### 4.13.3. Summary for Participant 9

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was a practically significant change in the child's behaviour following the introduction of the intervention. There does however, appear to have been a negative effect once the intervention was removed during the Maintenance phase.

## 4.14. Data Analysis: Participant 10

### 4.14.1. Behaviour Log Data




**Graph 4.14.1.1. A line graph showing the frequency of the target behaviour 'pushing in the line when lining up' over the 30 days of the Baseline, Intervention and Maintenance phases for Participant 10**

### Visual Analysis

| | |
|---|---|
| **Level** | there was a moderately abrupt change from the final data point of the Baseline phase to the first data point of the Intervention phase (1.13) with a slightly larger change between the Intervention and Maintenance phases (1.4). |
| **Trend** | the trend line reveals that there was an accelerating trend during the Baseline phase. The data points then follow a decelerating trend during the Intervention phase before becoming more static during the Maintenance phase. |
| **Slope** | there is a steep incline in the data points during the Baseline phase (0.63) before a sharp decline during the Intervention phase (-0.47) which continues into the Maintenance phase (-0.31). |
| **Variability** | there is significant fluctuation in data points during the Baseline phase (sd 3.33), which continues during the Intervention (sd 2.47) and Maintenance phases (sd 3.30). |
| **Mean Shift** | there was a small negative mean shift (-0.14) between the Baseline & Intervention phase with a small positive mean shift (0.21) occurring between the Intervention and Maintenance phases. |

**Figure 4.14.1.1: Visual Analysis for Participant 10**

Visual Inspection of Graph 4.14.1.1. suggests that whilst there was little change in the frequency of times the teaching assistant observed Participant 10 "pushing in the line when lining up" from the Baseline to the Intervention phase. The frequency of the behaviour also increased again during the Maintenance phase to a similar rate to the Baseline phase.

**Statistical Analysis**

A Cohen's d Effect Size (Cohen, 1988) was also calculated to measure the magnitude of treatment effect for each phase. See Table 4.14.1.2. for descriptive statistics and Table 4.14.1.3. for effect sizes.

| | N | Mean | Sd | 95% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| Baseline | 10 | 8 | 3.333 | 5.1655 | 10.3845 |
| Intervention | 10 | 6.9 | 2.46982 | 5.1332 | 8.6668 |
| Maintenance | 10 | 8.7 | 3.30151 | 6.3382 | 11.0618 |

**Table 4.14.1.2: A table providing descriptive statistics for the frequency data for Participant 10 for Baseline, Intervention & Maintenance phases**

| | Cohen's d Effect Size (95% Confidence Interval) |
|---|---|
| Baseline – Intervention | 0.37 (-0.59 to 1.19) |
| Intervention – Maintenance | -0.62 (-1.22 to -0.01) |

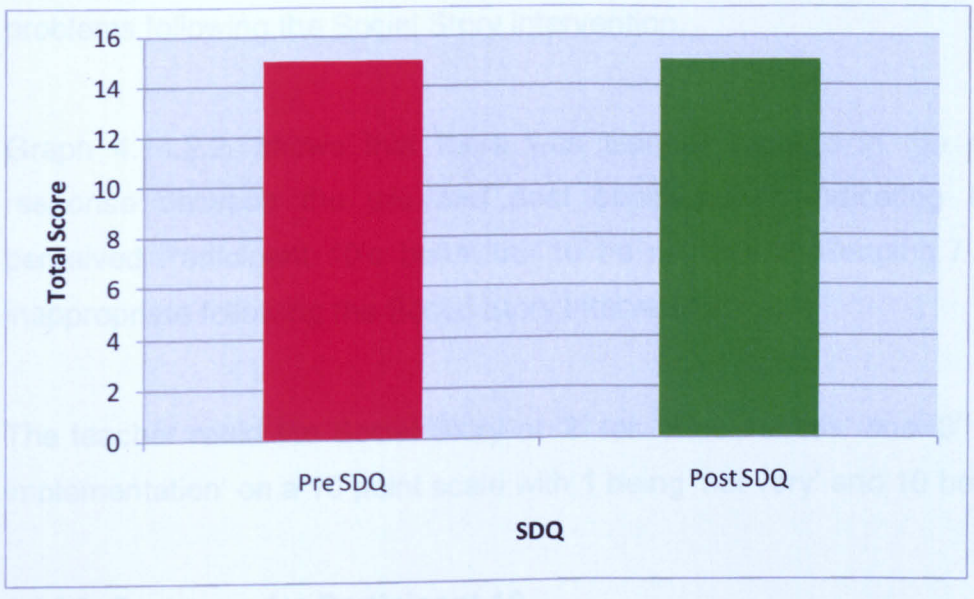
**Table 4.14.1.3: A table showing the Effect Sizes calculated to measure the magnitude of the treatment effect between experimental phases**

When considered against Cohen's (1988) guidelines, a **Cohen's d Effect Size of 0.37** between the Baseline and Intervention phases suggests there was a **'medium'** positive treatment effect. However, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -0.59 to 1.19. As this range includes 0 we must acknowledge that the Effect Size

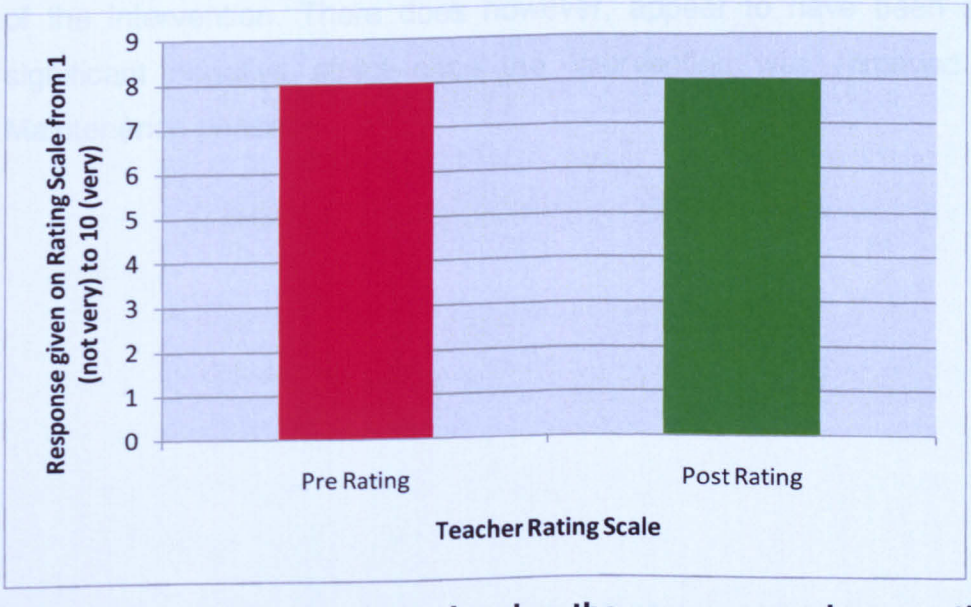
could be 0 and as such the Effect Size of 0.18 could have been obtained by chance.

The **Cohen's d Effect Size of -0.62** between the Intervention and Maintenance phases suggests that there was a **'large'** negative treatment effect. Additionally, the reported Confidence Interval range indicates that the true Effect Size is 95% certain to be in the range of -1.22 to -0.01. As this range does not include 0 we can be reasonably certain that a negative change was reported and a practically significant change occurred.

### 4.14.2. Strengths & Difficulties Questionnaire (SDQ) & Teacher Questionnaire (TQ) Data




**Graph 4.14.2.1. A bar chart showing the total scores obtained by Participant 10 on the pre and post SDQ**




**Graph 4.14.2.2. A bar chart showing the responses given on the pre and post rating scales for the question: 'How challenging / disruptive / inappropriate do you currently find the behaviour to be?' on a 10 point scale with 1 being 'not very' and 10 being 'very'**

Graph 4.14.2.1. shows that there was no change in the total scores on the SDQ between the pre and post questionnaire indicating no change in any difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems following the Social Story intervention.

Graph 4.14.2.2. shows that there was also no change in the rating scale response between the pre and post questionnaire indicating the teacher perceived Participant 10's behaviour to be no less challenging / disruptive / inappropriate following the Social Story intervention.

The teacher rated the Social Story at '**2**' for 'effectiveness' and '**8**' for 'ease of implementation' on a 10 point scale with 1 being 'not very' and 10 being 'very'.

### 4.14.3. Summary for Participant 10

Data obtained from the visual analysis and the Effect Size from the Behaviour Log, as well as the SDQ and the TQ appears to indicate that there was no practically significant change in the child's behaviour following the introduction of the intervention. There does however, appear to have been a practically significant negative effect once the intervention was removed during the Maintenance phase.

## 4.15. Summary of Results

Having analysed the data for each of the individual participants, the overall results will now be explored in more detail. The results will then be re-examined for meaning in Chapter 5. See Table 4.15.1.

As discussed earlier (section 4.3.3.) for a practically significant change to be noted, the intervention must also be judged by the clinician or teacher, to have led to a large change in the participant's behaviour (Brossart et al, 2006; Prentice & Miller, 1992). In the light of this, findings from the Behaviour log and the TQ will be considered together and a practically significant change will only be identified where data correlates. As the SDQ is a measure of general behaviour, concordance will not be necessary to identify a significant change but data will provide additional information about the utility of the intervention.

### 4.15.1. Experimental Hypothesis 1: Social Stories will be an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD.

Overall the visual analyses and the Effect Sizes obtained from the Behaviour Log data indicate that there was a significant decrease in the frequency of the target behaviours for nine out of ten of the participants from the initial Baseline phase to the Intervention phase. The Effect Size obtained for one of the participants (participant 10) was not 'large' and could statistically have been obtained by chance.

For seven of these participants (participants 2, 3, 4, 5, 6, 7 and 8) the frequency of the behaviours continued to decrease significantly during the Maintenance phase although in three of these cases (participants 2, 5 and 6) the changes could statistically have been obtained by chance.

For the remaining three participants (participants 1, 9 and 10), the frequency of the behaviours increased during the Maintenance phase after the intervention had been withdrawn.

For seven of the ten participants (participants 1, 2, 3, 5, 6, 7 & 9) these findings appear to concur with the data obtained from the SDQ which indicated that there was a decrease in the total scores over the 6 weeks between the pre test and the post test indicating a decrease in participant's perceived difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems. The scores for the remaining three participants (participants 4, 8 and 10) remained the same.

TQ data also shows that there was a decrease in the rating scale response over the 6 weeks between the pre and post teacher questionnaire for eight out of the 10 participants indicating that there had been a decrease in how challenging / disruptive / inappropriate teaching staff were finding the target behaviour to be following the intervention. For two pupils (participants 7 & 10) the rating remained the same.

Of interest here is that there appears to be a level of concordance between the three separate measures of behaviour, as the intervention was deemed to be least effective for Participant 10 from the Behaviour Log, the SDQ and the TQ.

Having considered the data obtained from the Behaviour Log and the TQ it appears that there has been a practically significant change in the target behaviours of eight out of the ten participants (1-6, 8 & 9) although the SDQ data revealed that there had only been a change in the general behavioural difficulties of seven of the participants (1, 2, 3, 5, 6, 7, 9). This could lead the researcher to **accept the experimental hypothesis** that **Social Stories will be an effective intervention for addressing the target behaviours** of feight out of the ten participants, but such assertions must be considered in the light of any limitations and threats to validity and reliability.

### 4.15.2. Experimental Hypothesis: Social Stories with photograph illustrations will be an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD.

The visual analyses and the Effect Sizes obtained from the Behaviour Log data indicate that there was a significant decrease in the frequency of the target behaviours from the initial Baseline phase to the Intervention phase for all five children (participants 1-5) who received a Social Story with photograph illustrations.

Additionally, for four of these children (participants 2-5), this decrease continued into the Maintenance phase after the story had been withdrawn.

For four of the five participants (participants 1, 2, 3 & 5) these findings correlate with the data obtained from the SDQ which showed that there was a decrease in the total scores over the 6 weeks between the pre test and the post test indicating a decrease in participant's difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems. The scores for the remaining participant (participant 4) remained the same.

TQ data shows that there was also a decrease in the rating scale response over the 6 weeks for all 5 of the children (participants 1-5) who received a Social Story with photograph illustrations indicating that there had been a decrease in how challenging / disruptive / inappropriate teaching staff were finding the target behaviour to be following the intervention.

Having considered the Behaviour Log and the TQ data it appears that there has been a practically significant change in the behaviours of all 5 of the participants although the SDQ data revealed that there had only been a change in the general behavioural difficulties of four of the participants (1, 2, 3 & 5). This could lead the researcher to **accept the experimental hypothesis** that **Social Stories with photograph illustrations will be an effective intervention for addressing the target behaviours** of all participants, but as with the previous assertion these findings must be considered in the light of any limitations and threats to validity and reliability.

**4.15.3. Experimental Hypothesis: Social Stories with symbol illustrations will be an effective intervention for addressing the target behaviours of children with a diagnosis of ASD.**

The visual analyses and the Effect Sizes obtained from the Behaviour Log data indicate that there was a significant decrease in the frequency of the target behaviours from the initial Baseline phase to the Intervention phase for four of the five participants who received Social Stories with symbol illustrations. The Effect Size obtained for one of the participants (participant 10) was not 'large' and could statistically have been obtained by chance.

For three out of five of the children (participants 6, 7 and 8) who received a Social Story with symbol illustrations this decrease either continued or was maintained during the 'Maintenance Phase'. For the other 2 participants (participants 9 & 10) there was a practically significant increase in the frequency of the target behaviours during the Maintenance phase after the stories had been withdrawn although for participant 9 this could statistically have been obtained by chance.

For two of the five participants (participants 6 & 9) these findings correlate with the data obtained from the SDQ which showed that there was a decrease in the total scores over the 6 weeks between the pre test and the post test indicating a decrease in participant's difficulties in areas of emotional symptoms, conduct problems, hyperactivity and peer problems. The scores for the remaining participants (participants 7, 8 and 10) remained the same.

TQ data also shows that there was a decrease in the rating scale response over the 6 weeks for three of the five of the children (participants 6, 8 and 9) who received a Social Story with photograph illustrations indicating that there had been a decrease in how challenging / disruptive / inappropriate teaching staff were finding the target behaviour to be following the intervention. The scores for the remaining participants (participants 7 and 10) remained the same.

Having considered the Behaviour Log and the TQ data it appears that there has been a practically significant change in the behaviours of three of the five

participants (6, 8 & 9) although the SDQ data revealed that there had only been a change in the general behavioural difficulties of two of the participants (6 & 9). This could lead the researcher to **accept the experimental hypothesis** that **Social Stories with symbol illustrations will be an effective intervention for addressing the target behaviours** of three out of the five participants, but as before, these findings must be considered in the light of any limitations and threats to validity and reliability.

These findings, any limitations and issues of reliability and validity will now be explored further in Chapter 5.

### 4.15.4. Inter-rater Reliability

A Cohen's Kappa score of 0.66 was calculated for the Visual Analyses of the graphical data revealing 'good' levels of agreement based on Fliess's (1981) 'rules of thumb'. For a copy of the confusion matrix and linearly weighted Cohen's Kappa calculations see Appendix K.

| | Behaviour Log (No of incidents of Target Behaviour) | | | | | SDQ (Total Scores) | | Teacher Questionnaire (Response given on the pre and post rating scales for the question: How challenging/disruptive/inappropriate do you currently find the behaviour to be? From 1 (not very) to 10 (very) | |
|---|---|---|---|---|---|---|---|---|---|
| Participant | Baseline | Intervention | ES | Maintenance | ES | Pre SDQ | Post SDQ | Pre Rating | Post Rating |
| 1 | 89 | 45 | 0.63 | 45 | -0.12 | 19 | 14 | 8 | 4 |
| 2 | 32 | 17 | 0.43 | 9 | 0.33 | 29 | 25 | 8 | 6 |
| 3 | 46 | 20 | 0.77 | 9 | 0.47 | 8 | 7 | 8 | 5 |
| 4 | 36 | 19 | 0.60 | 15 | 0.30 | 12 | 12 | 7 | 6 |
| 5 | 32 | 12 | 0.60 | 4 | 0.41 | 14 | 13 | 7 | 3 |
| 6 | 20 | 14 | 0.63 | 6 | 0.61 | 11 | 8 | 3 | 1 |
| 7 | 22 | 13 | 0.41 | 3 | 0.55 | 11 | 9 | 10 | 2 |
| 8 | 22 | 12 | 0.54 | 1 | 0.62 | 18 | 18 | 7 | 5 |
| 9 | 50 | 35 | 0.51 | 41 | -0.24 | 11 | 8 | 7 | 5 |
| 10 | 80 | 69 | 0.18 | 87 | -0.29 | 15 | 15 | 8 | 8 |

**Table 4.15.1. A table showing the data obtained for all 10 of the participants from the Behaviour Log, the SDQ and the TQ**

# CHAPTER 5: DISCUSSION

## 5.1. Introduction to Discussion

The discussion chapter will examine the results from the ten single case experiments in relation to the research questions and hypotheses arising from the literature review. It will offer interpretations and opinions; explain the findings and the contribution the study has made to the existing research base; explore limitations and issues of validity and reliability; make suggestions for future research and consider the implications of the findings for Educational Psychologists (EPs) practice. In these ways, it is hoped that the current study can make a valuable and original contribution to the growing evidence base on Social Stories in order that professionals can draw upon research to inform interventions.

## 5.2. Findings of the Current Study

The aim of the study was to investigate the effectiveness of Social Story interventions with photograph or symbol illustrations for addressing the target behaviours of children with a diagnosis of Autism Spectrum Disorder (ASD).

Following initial consultations with the teaching staff and the children involved, target behaviours were identified and baseline measures of the child's behaviour were recorded in a Behaviour Log (Baseline Phase). Social Stories were then composed and implemented in accordance with Gray's (2004) guidelines and measures of the target behaviour continued to be taken whilst the story was being read (Intervention Phase) and after it had been withdrawn (Maintenance Phase).

Findings suggested that Social Stories led to a practically significant change in the frequency of the target behaviours of eight boys with diagnoses of ASD as demonstrated by the Behaviour Log and Teacher Questionnaire data. For six of the boys teaching staff also reported that there had been a decrease in the

children's overall behavioural difficulties as measured by the Strengths & Difficulties Questionnaire (SDQ) (Goodman, 1997). As such the intervention appears to have been effective. In line with the assertions of Brossart, Parker, Olson & Mahadevan (2006) and Prentice & Miller (1992) the intervention was considered to have led to a practically significant change when it had been judged by the clinician or teacher, to have had an impact on the participant's behaviour. Throughout this section more detailed information relating to the patterns of effectiveness will be highlighted and considered in the light of the research questions.

### 5.2.1. Are Social Stories an effective intervention for addressing the target behaviours of primary aged children with a diagnosis of ASD?

The Behaviour Log data revealed that the implementation of the stories led to a practically significant decrease, as identified by a 'large' Cohen's d Effect Size' (Cohen, 1988), between the frequency of incidents of target behaviour for nine of the participants from the Baseline phase to the Intervention phase. Importantly, for seven of these participants this decrease continued through into the Maintenance phase. Such a pattern suggests that, not only was the intervention effective in addressing the target behaviours during implementation, it was also effective two weeks after the stories had been removed. This is an important finding as to date few studies have reported on maintenance following a Social Story intervention and just 8 reported levels to be high (Crozier & Tincani, 2007; Kalyva & Agaliotis, 2009; Kuoch & Mirenda, 2003; Ozdemir, 2008; Quirmbach et al, 2009; Schnedier & Goldstein, 2009; Wright, 2009).

In addition to the Behaviour Log, a pre and post test SDQ (Goodman, 1997) and a self-composed Teacher Questionnaire (TQ) were issued to gather additional data relating to the impact of the intervention on the child's general and target behaviour.

The data obtained from the SDQ offers information supportive of the findings from the Behaviour Log for seven out of the ten participants, with a decrease in total scores. This suggests that their teachers and teaching assistants believed

that there had been a decrease in the child's difficulties in relation to emotional symptoms, conduct problems, hyperactivity and peer problems of the course of the intervention.

Further support for the intervention was obtained from the TQ responses which indicated that in eight out of the ten cases, children's behaviour was reported to be less challenging at the end of the 6 weeks and that all except for two of the teachers rated the Social Stories at '6'; or above for effectiveness on a scale from 1 (not at all effective) to 10 (very effective). Of significant social importance is the finding that all of the participating staff rated the Social Stories at a '5' or above on a 10 point scale for ease of implementation and indicated they would use the intervention again, suggesting high levels of treatment acceptability.

### 5.2.2. Are Social Stories with photograph or symbol illustrations effective for addressing the target behaviours of primary aged children with a diagnosis of an ASD?

The current study also sought to investigate the importance of visual cues and in particular the potentially differential effectiveness of photographs and symbols in Social Stories to enhance social understanding (Gray, 2003). This was thought to be important as, prior to this study there has been no consideration in the research literature of the types of illustrations that may be most beneficial. Furthermore, whilst Gray's (2004) guidelines suggest that Social Stories could include personalised illustrations that could consist of either drawings, pictures or objects depending on the needs of the child, they fall short of providing guidance on the suitability and efficacy of particular forms of illustrations.

Of considerable interest therefore is the finding that, when data from all three of the measures were considered together, there appeared to have been a practically significant change in the target and general behaviours for all except one of the children who received Social Stories with photographs, but for only two of the five children who received Social Stories with symbols.

Behaviour Log data revealed that there was a practically significant decrease in the frequency of the target behaviours for all of the children who received Social Stories with photographs once the intervention had been introduced. In contrast, significant decreases were found for only four of the five children who received Social Stories with symbols. Additionally, all except one of the children who had received Social Stories with photographs continued to present with a reduction in target behaviours once the Social Story had been removed indicating levels of sills maintenance. This was only true for three of the children who received Social Stories with symbols and for one child there was a significant increase.

These findings were supported by the SDQ data which indicated that four out of the five staff believed that there had been a decrease in the child's difficulties having received Social Stories with photographs, whilst just two out of five identified such a difference for children who had received Social Stories with symbols. Furthermore, the same pattern of results emerged from the TQ data as all of the teachers who utilised stories with photographs reported that the child's behaviour was less challenging / disruptive / inappropriate following the Social Story intervention, whilst just three out of the five staff who utilised stories with symbols reporting a reduction.

Although not the focus of the study, it is of interest that the child for whom the Social Story intervention proved to be least effective had very complex needs and diagnoses of Pervasive Developmental Disorder, Attention Deficit Hyperactivity Disorder and Global Learning Difficulties. This is noteworthy as the review of the literature highlighted that few studies have involved children with learning difficulties. That said, to date findings have been positive, with both Kalyva & Agaliotis (2009) and Whitehead (2007) reporting successful outcomes for children with diagnoses of learning disabilities and a child with global developmental delay and moderately learning difficulties respectively.

## 5.3. Interpretations & Analysis

As discussed in Chapter 2, the success of Social Story interventions in meeting the needs of children with ASD may stem from their capacity to build on the strengths and address the difficulties that are associated with the condition (Baron-Cohen, Leslie & Frith, 1985; Greenway, 2000; Hodgdon, 1995; Kistner, Robbins & Haskett, 1988; Krantz & McClannahan, 1993; Lincoln, Courchesne, Kilman, Elmasian & Allen, 1988; Myles & Simpson, 2001; Ozdemir, 2008; Quill, 1997; Rowe, 1999; Scattone, Wilczynski, Edwards & Rabian, 2002. Schuler, 1995; Smith, 2001; Theimann & Goldstein, 2001; Whitehouse & Harris, 1984; www.nas.org.uk b). Social Stories are believed to target the areas of social awareness and interaction; social communication and language; and lack of imagination and rigidity of thought, that comprise the 'triad of impairments' (Wing & Gould, 1979) and currently underpin the DSM-IV criteria for a diagnosis of ASD.

### 5.3.1. Social Stories and social awareness and interaction

Social Stories are believed to support children in developing social awareness by helping them to acquire mental representations of specific social situations (Rowe, 1999). TQ responses indicate that this was evident in the current study:

*"(He) used them (the book and the photos) as a sort of 'photographic' checklist".* Participant 5

The perspective sentences within the stories are intended to provide the child with a greater appreciation of the intentions, needs and desires of others, helping them to overcome the social cognitive difficulties arising from the 'Theory of Mind' deficit that was proposed by Baron-Cohen et al (1985) (Greenway, 2000). The responses from the staff involved in the study seemed to imply that the stories had indeed been successful in promoting this understanding:

*"(Child's name) knows that if I say 'no' or 'now is not the time to talk to me' that I need him to stop and he responds and stops."* Participant 4

### 5.3.2. Social Stories and social communication and language

Deficits in language and social communication skills are also a characteristic feature of ASD. Children may have a very literal understanding with difficulties interpreting verbal and non-verbal communication. In contrast, studies have identified that individuals with ASD often have strengths in the areas of visual-perception (Lincoln et al, 1988), interpretation of static visual stimuli (Hodgdon, 1995) and hyperlexia (a pre-occupation with letters and words and exceptional word recognition skills with delayed comprehension) (Whitehouse & Harris, 1984). Numerous researchers have also identified that visual cues such as written prompts, pictures and graphics can improve social communication and behaviour (Kistner et al, 1988; Krantz & McClannahan, 1993; Ozdemir, 2008; Quill, 1997; Schuler, 1995; Theimann & Goldstein, 2001). As a consequence, it is widely accepted that visual support and visual teaching are effective in meeting the needs of many individuals with ASD (Mesibov & Howley, 2003).

The visual nature of Social Stories which place fewer verbal language demands on their readers would therefore seem to build upon the strengths of individuals with ASD.

### 5.3.3. Social Stories and lack of imagination and rigidity of thought

Many children with ASD present with limited imagination and rigidity of thought. Consequently, once rules and routines have been learned, individuals may rigidly adhere to them (Scattone et al, 2002). The visual representation of the rules and routines that apply to specific social situations within a Social Story is therefore considered to be less confusing than other forms of social skills teaching e.g. a social skills group, as information is presented explicitly (Ozdemir, 2008; Smith, 2001; Quill, 1997).

It seems likely therefore, that Social Stories may have been effective in reducing the frequency of target behaviours in this study as they provided explicit visual information about the rules governing behaviour in specific social situations.

### 5.3.4. Social Stories and illustrations

The findings in relation to the use of photographs and symbols require greater consideration as this is the first study that has sought to investigate their impact. Whilst the findings are limited by the small sample size there is some tentative evidence to suggest that photograph illustrations may be more effective in reducing target behaviours and in maintaining treatment effects. This assertion is based upon the finding that there was a practically significant decrease in the frequency of the target behaviours for all five of the children who received Social Stories with photographs, but for just three of the children who received stories with symbols. Whilst any conclusions must be drawn with caution, such evidence provides an important contribution to the limited literature examining the critical components of Social Stories (Ali & Frederickson, 2006; Reynhout & Carter, 2006).

In interpreting these results it must be acknowledged that there may be pragmatic reasons as to why these differential results were observed. Whilst all of the Social Stories were personalised following information gathered during pre-intervention interviews, those children who received Social Stories with photographs had a greater involvement in their development. These children were required to pose for photographs at the outset and consequently it is possible that this additional involvement might have had an impact on the increased efficacy of Social Stories with photograph illustrations. It certainly seems clear from the TQ responses that the photograph illustrations contributed to the personalisation of the Social Stories:

*"(Child's name) still needs to be prompted occasionally to listen to the adult giving instructions/teaching, however, he does appear to be a little more focused. Making it personal with photos made him more interested in reading it."* Participant 1

*"(Child's name) is now much better at organising himself at the start of the day. It has also benefited the other children that sit on his table as they are no longer obliged to help him and his teacher and I rarely have to prompt him so we can focus on the rest of the class. Using photos in the social story really helped him to remember what he had to do. He loved his book and used them as a sort of 'photographic' checklist".* Participant 5

An alternative explanation arises from the research investigating how children with autism understand drawings. In her study (Allen, 2009), uncovered evidence to suggest that children with ASD have difficulty linking pictures to real world referents. Such evidence appears to offer an explanation for the greater success of photograph illustrations in reducing the frequency of incidents of target behaviour as they provide an exact representation of the social situation. As such children need not concern themselves with the symbol-referent relationship.

This study also found that children with ASD have difficulties relating other people's drawings to real world objects but have no problems relating their own artwork (Allen, 2009). The author concluded that such findings suggest that for children with ASD an understanding of artwork required knowledge of intentionality. It appears that children are able to relate their own drawings to real life referents because they are aware of their own intentions in producing the picture and so focus on the symbol-referent relationship. In contrast, when looking at the drawings of others, children are less aware of the illustrators' intentions and are more likely to focus on the details and appearance of the drawing. It would appear that such difficulties may arise from the 'Theory of Mind' deficit and they offer a further explanation for the findings for the current study. If the ability to relate pictures, drawings and symbols to real life objects and situations is dependent on knowledge of the illustrator's intentions then it would seem to be important that children are involved in the selection of the symbols or the drawing of the pictures that are used in Social Stories.

### 5.3.5. Social Stories and children with learning needs

The finding that the Social Story intervention was not effective for the child who had an additional diagnosis of global learning difficulties within this study is inconsistent with the outcomes of the only two studies that have previously involved children with similar needs (Kalyva & Agaliotis, 2009; Whitehead, 2007).

One possible reason for this could be the level of learning needs experienced by the respective children. In Whitehead's (2007) study, details of the child's cognitive skills have not been provided. In contrast in Kalyva and Agaliotis's (2009) study, they explain that children were selected on the basis of a full scale IQ score greater than a standardised score (ss) of 80 (as measured by the Wechsler Intelligence Scale for Children (WISC-3, 1991). As the cognitive profile of the participants was not a key factor in the aims of the current study, the researcher did not undertake specific assessments. However, within the child's Statement of Special Educational Needs it is reported that on the Core Cluster Scales for the of the British Ability Scales – Second Edition (BAS II) he achieved scores for verbal comprehension which were at the 1$^{st}$ percentile (ss of 62-67), scores for non-verbal comprehension which were at the 23$^{rd}$ percentile (ss of 89) and scores for spatial skills which were at the 3$^{rd}$ percentile (ss 71-72). The scores for verbal comprehension and spatial skills are considerably lower than the criteria for inclusion in Kalyva and Agaliotis's (2009) investigation of Social Story efficacy with children with learning disabilities.

Another possible explanation derives from the low score for verbal comprehension as studies have identified that comprehension and receptive language skills are associated with Social Story success (Crozier & Tincani, 2007; Reynhout & Carter, 2007). Whilst the guidelines for the implementation of the Social Stories stipulated that teaching staff ensured understanding by asking simple comprehension questions, the researcher cannot be certain that this instruction was followed nor that children's answers were accurate.

In the following section, issues such as this will be explored in more detail alongside other 'nuisance' variables and limitations which threaten the validity and reliability of the study findings.

## 5.4. Limitations & Threats to Validity and Reliability

Although the current study has made a potentially valuable and original contribution to the existing literature on Social Stories, there are several limitations which must be taken into consideration. In the following section, the researcher will refer to the limitations that were first discussed in section 3.4 and which, having undertaken the study, are considered to have posed a potential threat to the validity and reliability of the findings.

### 5.4.1. Limitations of the Methodology & Study Design

Multiple single case experiments (SCEDs) utilising an ABA design were adopted for the current study in order to assess the impact of the Social Story intervention on each of the individual participants over time during Baseline (A); Intervention (B) and Maintenance (A) phases.

SCEDs, whilst promoting high levels of internal validity as a result of the continuous measurement of an individual's responses, are considered to possess low levels of external validity (Barlow et al, 2009; Robson, 2002). Whilst the researcher argued for the adoption of this methodology in section 3.4.1 and attempted to overcome the issue by replicating the experiment with multiple participants, it is important to acknowledge that SCED findings must be considered within certain parameters.

Although Social Stories have been shown to be effective for six of the ten children in this study this does not indicate that they would be successful for other individuals. As with the majority of SCED studies, there are issues of generalisability inherent in the small sample. Additionally, having selected participants on the basis of their having an existing diagnosis of ASD, being aged 5-11, attending mainstream schools and presenting with specific target

behaviours, it is not possible to generalise the findings to other children who do not share these characteristics. It is also not possible to generalise the findings to situations in which different professionals are involved in developing and implementing the intervention.

In spite of these parameters, SCEDs provided the most appropriate methodology for investigating the effectiveness of Social Stories. As discussed in section 3.3.1 They have been proven to be relevant for evaluating educational practices at the level of the individual (Horner, Carr, Halle, McGee, Odom, Wolery, 2005) and for producing reliable data relating to an individual's behaviour across the course of separate experimental phases (Robson, 2002) enabling consideration of cause-and-effect relationships (Cohen, Manion & Morrison, 2007). In doing so, they provide an alternative methodology to larger and more expensive group studies (Neuman & McCormick, 2000).

A group experiment would have required the aggregation of the responses from a random heterogeneous group of individuals each of whom presented with target behaviours which varied considerably in nature and frequency, thus reducing the likelihood that findings would be relevant to an individual (Barlow et al, 2009). In contrast, identifying the variability of individuals by adopting SCED methodology, enabled important information to be gathered about the responses of similar individuals undergoing the same treatment in future and therefore increasing generality of the findings (Barlow et al, 2009).

ABA designs are often criticised in relation to the ethical issues associated with ending on a withdrawal phase following the removal of a potentially effective intervention. However, such a design can be defended on the basis that it provided an opportunity to gather reliable baseline data, whilst allowing adequate time to implement the intervention and obtain important maintenance data with the time restrictions of a 6 week school half term. Those participating in the study were free to continue implementing the Social Story upon completion of the project.

Finally, as discussed in section 4.3, there remains a considerable amount of controversy in the analysis of single case experimental design studies and much of this is related to the limitations inherent in many of the methods.

Visual Analysis is thought by some to permit subjectivity and inconsistency in evaluations (Bloom & Fisher, 1982; Kazdin, 1982; Wampold & Furlong, 1981; Wolery & Harris, 1982), an issue highlighted by frequently low levels of agreement between judges (DeProspero & Cohen, 1979; Jones, Weinrott & Vaught, 1978; Ottenbacher, 1986; Wampold & Furlong, 1985). However, inter-rater agreement levels in the current study were found to be 'good' (Fliess, 1981) and the use of visual analysis can be justified by its ability to identify large, clinically significant treatment effects (Norbakhash & Ottenbacher, 1994) and its continuing widespread use for evaluating SCEDs (Busk & Marasculio, 1992; Kazdin, 1976; Kratochwill & Brody, 1978; Parker Brossat & Vannest, 2005).

Similarly, whilst Effect Size measurements are deemed to be heavily influenced by contextual factors (Maxwell, Camp & Avery, 1981; Mitchell & Hartmann, 1981; Rosnow & Rosenthal, 1989) they are widely recommended for analysing SCED data (Busk & Serlin, 1992; Cohen, 1990; Kupfersmid, 1988; Rosnow & Rosenthal, 1989). Unlike most statistical techniques e.g. parametric tests (Fox, 1991; Wolery & Harris, 1982), Effect Sizes are not affected by the serial dependency of data that is commonly associated with SCEDs.

In the current study, issues of subjectivity in relation to visual analyses have been ameliorated by the addition of more objective statistical procedures (Barlow, Nock & Hersen, 2009; Park, Marascuilo & Gaylord-Ross, 1990). Furthermore, the use of statistical measures has provided an opportunity for the data obtained from this study to be considered alongside those from others in future meta-analyses.

Gathering additional information from those involved in the study by utilising the SDQ and TQ, and looking for convergence between the data obtained from these questionnaires and from the Behaviour Log, has offered important supplementary contextual information.

### 5.4.2. Issues of Validity & Reliability

In Section 3.4.2. the potential threats to validity and reliability specifically associated with this study were identified and explored. Considering such threats at the outset provided an opportunity to control for and reduce their effects whilst acknowledging that they could "never be erased completely" (Cohen et al, 2007).

At this stage it is important to reconsider issues of reliability and validity in relation to the findings of the study.

### 5.4.3 Description of Participants and Setting

Whilst information has been presented regarding the participants' needs, ages and schools (see Section 3.3.2), it was not possible within the scope of this study to carry out detailed assessments at the outset. Had such assessments been undertaken, more specific operational definitions of the participants' could have been developed, enhancing the replicability of the study (Wolery & Ezell, 1993).

### 5.4.4 Baseline

As baseline phases in single case experimental designs are used to compare the effects of the implementation of the intervention, it is recommended that a clear description of the baseline condition should be provided and that measures of the dependent variables should continue to be taken until a consistent pattern is observed (Horner et al, 2005).

Whilst adequate descriptions of the baseline condition were provided (see section 3.3.5.2), it was not possible for pragmatic reasons e.g. the constraints of the school term, maintaining stake-holder engagement, to continue to implement baseline procedures until a stable pattern emerged. Issues of level, trend, slope and variability were explored during visual analysis of the data and it was clear that there were high levels of variability in behaviour within and across participants. Failure to establish a consistent baseline presents a potential threat to the validity and reliability of the findings.

### 5.4.5. Observational Data

By developing focused, objective, explicit and exhaustive operational definitions of the target behaviours and designing a Behaviour Log sheet that was simple to use, the researcher aimed to increase the reliability of the observational data (Barlow et al, 2009; Robson, 2002).

It must be noted however, that in spite of these measures, the nature of a busy classroom environment, means that it is likely that staff were not always able to give their full attention to the recording of behaviours for an individual child. It was for this reason that the children's designated Teaching Assistant's were chosen to complete the Behaviour Log, but it remains possible, that they were not always able to focus solely on their observations. By incorporating a second observer to record behaviour during specific sessions, it would have been possible to take a measure of inter-observer reliability. It was however not feasible to carry out these additional observations given the time constraints of this project.

### 5.4.6. Dependent Variables

As stated in section 3.4.4., if a researcher is to be able to conclude with any confidence that experimental findings could be replicated in non-experimental settings then the dependent variables must possess certain characteristics. These have been highlighted below and will be discussed in light of the current study:

**5.4.6.1. Dependent variables are operationally defined:** Although the researcher endeavoured to work with all those involved to develop operationally defined dependent variables that allowed for direct observation (Horner et al, 2005) it is possible that a level of subjectivity remained. The aim was to create definitions (utilising information from the pre-intervention interviews) that were focused, objective, explicit and exhaustive. For some of the positively worded target behaviours e.g. 'play-fighting at playtime', this was quite a simple task, but for others e.g. 'not paying attention in class' it was much more difficult to ensure that all possible manifestations of the behaviour had been covered in

order that the teaching assistant could be confident in noting whether or not a behaviour had occurred (Robson, 2002).

**5.4.6.2. Dependent variables are measured repeatedly:** Having 10 observational days during each experimental phase, should have ensured that sufficient measurements of the target behaviour were observed and recorded. However, having to restrict the baseline phase to a set period of time, it was not possible in some instances, to establish a consistent pattern of performance prior to the implementation of the intervention (Horner et al, 2005).

**5.4.6.3. Dependent variable recording is assessed for consistency:**
As was discussed previously (section 3.4.3.2) it was not feasible within the time and staffing constraints of the current study to conduct the simultaneous researcher observations that are recommended in order that the consistency of recording can be assessed by measures of interobserver agreement (Horner et al, 2005).

By issuing participating teachers and teaching assistants with Social Story Guidelines and Checklists the researcher hopes to have ameliorated this threat to the best of her abilities.

**5.4.6.4. Dependent variables are selected for their social significance:**
The dependent variables within this study were the measures of the frequency of target behaviours and of teacher's perceptions of the impact of the intervention. These would seem to be highly relevant to any evaluation of the effectiveness of social stories in educational contexts. They provided an assessment of both the conceptual theories underpinning Social Story interventions (see Section 2.6.4) and information about the target behaviour which was important both to the child and the adults who teach them (Horner et al, 2005).

**5.4.7 Independent Variables**
The independent variables within this study were the Social Stories with photographs and with symbols. By providing a detailed explanation of how

these stories were composed and implemented, future replications of the study should be possible (Cohen et al, 2007).

### 5.4.8. Internal Validity

#### 5.4.8.1. History

The researcher attempted to control for the occurrence of any additional events during the experimental period by stating at the outset that children could only participate in the study if they were not currently receiving other interventions. Unfortunately, one of the children in the study (Participant 1) started attending a 'Social Skills Group' during the Intervention Phase. As a consequence, the researcher cannot be certain that the positive outcomes obtained for this child in terms of the decrease in the frequency of target behaviours and the improved teacher rating were directly related to the Social Story.

#### 5.4.8.2. Treatment Integrity

The researcher developed specific procedures in order to ensure that the intervention was implemented as planned (Wilkinson, 2006). A method of participant self-reporting was adopted in which guidelines were established for the construction and administration of the Social Stories, utilising the same materials and promoting a uniform approach across all participants. Daily checklists were used to assess treatment integrity and teachers were required to indicate whether the story was read and when it was read. Completed checklists revealed that stories were read on all of the required days to all of the participants, indicating treatment integrity levels of 100%.

This method was chosen as it was not possible within the time constraints and logistics of this 'real world' research project for systematic observations to be carried out across 20 participants in nine different school settings. Self-report methods are considered to provide psychologists with a useful mechanism for gathering treatment integrity data (Wilkinson, 2006), but it has been suggested that the technique may overestimate levels of treatment fidelity and produce inaccurate results (Gresham, MacMillan, Beebe-Frankenberger & Bocian, 2000).

In addition, the researcher made no attempt to control for the use of prompts alongside the Social Story. This decision was made in order to promote ecological validity as on the pre-intervention questionnaires all of the teachers reported regular use of verbal prompts to support the child's behaviour as part as their daily practice. Teachers were asked to record the use of prompts during the study using the Social Story checklist forms and these revealed that all teachers used verbal prompts during throughout the experiment although rates varied. This raises the question of whether it was the verbal prompting or the Social Story that was the critical component of the intervention. The researcher would argue that as teachers reported regular use of verbal prompts prior to the intervention without any success; it is unlikely that prompts are responsible for the changes in behaviour. Future research controlling for the use of verbal prompts would help to clarify whether they are important in promoting the effectiveness of Social Stories.

#### 5.4.8.3. Selection Bias

As mentioned in section 3.4.3.3, the researcher attempted to control for this bias by randomly allocating pupils to receive wither Social Stories with 'photographs' or 'symbols' in order to eliminate the possibility that the selection of participants may be responsible for the observed outcomes (Cohen et al, 2007). However, just one of the participants had an additional diagnosis of global learning difficulties which, as discussed earlier, might have been associated with the ineffectiveness of the intervention. This participant was also allocated to the group who received a Social Story containing 'symbol' illustrations and as such it is possible that selection bias may have influenced outcomes.

#### 5.4.8.4. Respondent Bias

It was not possible to eliminate the effect of respondent bias in the current study. The researcher hoped to reduce its impact by utilising self completion behaviour logs and questionnaires rather than conducting observations and semi-structured interviews thus limiting the influence and presence of the interviewer (Robson, 2002). It is possible though that participant's perceptions

of the role of the researcher might still have impacted on their responses. As the researcher held a post as a Trainee Educational Psychologist within the authority in which the project was undertaken, there might well have been a desire on behalf of the participants to provide favourable responses. Conversely, where schools were seeking to attain additional support for a pupil, it may have been perceived to be in a schools interests to suggest that the intervention had been unsuccessful in order to emphasise the severity of a child's needs.

#### 5.4.8.5. Researcher Bias

By ensuring there was minimal involvement in the project once the research was underway and by adopting a methodological and data triangulation approach (Robson, 2002) the researcher attempted to reduce the effect of researcher bias on the study outcomes. However, as a professional working to support needs of children and young people, it is not possible to completely eliminate the threat of researcher bias.

#### 5.4.8.6. Experimental Mortality

The loss of participants due to attrition and drop out is a major threat to validity in longer-running experiments. This was not an issue in the current study as all of the participants completed the intervention.

### 5.4.9. External Validity

#### 5.4.9.1. Lack of representativeness of available and target populations

If a researcher wishes to generalize from the findings of a study to a wider population then they must ensure that the participants are representative of that population (Cohen et al, 2007). As was discussed in section 3.4.8.1 these issues can be addressed by adopting appropriate sampling and randomisation procedures.

#### 5.4.9.2. Sampling

In selecting participants for the study the researcher hoped to be able to generalise findings to a population of mainstream, primary aged children with a

diagnosis of ASD who were presenting with specific frequently occurring target behaviours and as such a purposive sampling approach was adopted. In employing purposive sampling the researcher recognised that it was not possible to generalise to a wider population of children but hoped to identify a sample that was representative of this target population.

The result of the purposive sampling approach was that 10 children were selected from 8 different mainstream primary schools. The children ranged in age from 5 – 11 and they were all boys. All of the children had a Statement of Special Educational Needs (SEN).

The researcher accepts that having narrowed the sample to this population of children it is not possible to generalise findings to specialist and secondary settings; to girls; to boys under 5 and over 11; and for boys without a diagnosis of ASD and a Statement of SEN. Furthermore, as can be seen from Table 3.3.2 the majority of the pupils were recruited from Key Stage 2 classes (aged 7-11) and had a diagnosis of Asperger Syndrome and as such are not truly representative of the primary age range or of the needs of children across the breadth of the Autism Spectrum.

#### 5.4.9.3 Randomisation

The random assignment of participants to 2 experimental conditions (photograph illustrations or symbol illustrations) decreases the likelihood that there were pre-existing differences between the participants prior to the implementation of the Social Story. As such, the researcher can be confident that any differences between the participants following the social story intervention were determined by the manipulation of the illustrations.

#### 5.4.9.4 Sample Size

The final issue related to the representativeness of the sample is the sample size. The small sample size of 10 participants reduces the likelihood that the participants were truly representative of the wider target population.

### 5.4.10 Social / Ecological Validity

The researcher believes that the current study possesses high levels of social / ecological validity.

Firstly, the dependent variables (the frequency of the target behaviours and the teacher's perceptions of these behaviours) had been identified as being of importance to both the children and staff. Additionally, all those involved in the study rated Social Stories at a 5 or above on a 10 point scale for ease of implementation and all except for two of the participants rated them at a 6 or above for effectiveness. Finally, all of the participants indicated that they would use Social Stories again in the future indicating sustainability (Horner et al, 2005).

### 5.4.11 Content & Construct Validity

Content validity (the extent to which a scale measures what it sets out to measure and represents every aspect of a particular social construct), and construct validity (the extent to which a scale measures or correlates with a psychological construct) (Cohen et al, 2007) were also important factors in this study. It was important that the behaviour log, the pre and post intervention TQs and the SDQ had high levels of construct and content validity if the researcher was to be able to draw any accurate conclusions as to the impact of the Social Story intervention on behaviour.

As mentioned previously in the methodology section, the researcher addressed this threat to the validity of the Behaviour Log by using the pre-intervention questionnaire to identify and define the target behaviour and by developing a coding scheme in order that teachers could be confident that it had been observed prior to recording it on the Behaviour Log frequency chart.
In this way, the researcher ensured that her construction of the presenting behaviour agreed with the teacher's construction of the same behaviour and the recording was accurate.

Whilst the TQ was devised by the researcher, the questions within it were based upon items included within the Behaviour Intervention Rating Scales. A

correlational analysis of these scales has identified them as a valid measure of treatment evaluation constructs of acceptability and effectiveness (Elliot & Treuting, 1991).

The SDQ has also been proven to be a valid and reliable measure (Goodman, 2001). A study conducted by Muris, Meesters, Eijkelenboom & Vincken (2004) reported adequate levels of inter-rater agreement, whilst Mellor (2004) reported satisfactory test-retest reliability.

### 5.4.12. Concurrent Validity

Methodological and data triangulation approaches were used to achieve concurrent validity within this study. The researcher employed three different methods of data collection: the Behaviour Log providing quantitative observational data; the Teacher Questionnaire providing both quantitative and qualitative data; and the SDQ providing a quantitative measure. Each of these measures was intended to provide data that could be used to answer the initial research questions. In combining these measures it was hoped that the researcher could improve the validity and reliability of the findings.

Concurrent validity could have been strengthened by the adoption of a triangulation approach to the gathering of data from different sources. The data obtained within this study was gathered exclusively from the teaching staff involved in the delivery of the Social Story intervention, gathering additional information from the children who received the stories and from their parent(s) or caregiver(s) would have ensured that the researcher could have had a greater confidence in the reliability and validity of the findings.

## 5.5. Ethical Considerations

As stated in Chapter 3, this study was designed in accordance with the ethical guidelines as advised by the British Psychological Society: Ethical Principles for Conducting Research with Human Participants' within the 'Code of Ethics and Conduct' (BPS, 2009) and these principles were adhered to at all stages of the research. The principles most relevant to this project are those concerned with consent, the right to withdraw, debriefing and confidentiality.

### 5.5.1. Consent (Principle 2.3; BPS, 2009)

As the children participating in the study were under 16, covering letters were distributed to parents and school staff and consent was obtained prior to the start of the study. The covering letters detailed the objectives of the study and outlining the 'nature, purpose and anticipated consequences' and offered to give additional information if it were deemed necessary. The letter provided an overview of the research procedure in order that those involved were aware of what the process would involve. Completed consent forms were received for each of the participants prior to the start of the study.

Furthermore, the researcher ensured that she gained the consent of each of the children who were participating in the study during the pre-intervention interviews. On one occasion, the child was happy to take part and to have a story written for him but wanted to choose the teacher who read it with him. This request was upheld as it was considered important that the children were happy to consent to the entire experimental process.

### 5.5.2. Right to withdraw & debriefing (Principle 2.5 & 2.6; BPS, 2009)

Both the covering letter and the pre-intervention teacher and child interviews established the participants' 'right to withdraw' from the study at any stage and offered a feedback and 'debriefing' session to all involved if this would be appreciated. None of the participants withdrew from the study and to date none have requested feedback on the study findings. The researcher intends to provide an Executive Summary to each of the participating schools on completion of the project.

### 5.5.3. Confidentiality (Principle 2.7; BPS, 2009)

Within the letters, parents and school staff were assured that all information provided would be treated confidentially and, when written up, would not be identifiable. To this end, the author ensured that all data was kept in a locked filing cabinet during the project and data that has been incorporated into the study write up has been kept anonymous.

## 5.6. Future Research

Whilst this study has contributed additional information and made a unique contribution to the existing research base on Social Stories, a number of questions remain as to the factors that are associated with successful Social Story interventions.

### 5.6.1. Study Design

As stated previously in section 2.9.7., the majority of the studies, including this one, that have been conducted to date, have been examples of case studies and single case-experiments

The researcher agrees with Barlow et al (2009), that single case methodologies offer a powerful mechanism for exploring human behaviour by focusing on the individual and as such provide an appropriate and realistic approach for evaluating an individualised intervention like Social Stories (Ali & Frederickson, 2006).

She would however argue that in order to establish reliability and generality of findings replication is necessary. The replication of single case experiments for different individuals, implemented by different professionals in different settings will help to secure a stronger evidence base for Social Stories whilst overcoming the need for the co-ordination of Randomised Controlled Trials (RCTs) which can be expensive, time consuming and difficult to execute in real world contexts.

### 5.6.2. Participants

This study has provided additional support to the growing number of studies that have reported the successful use of Social Story interventions to address the target behaviours of children from the age of 3 to 15 who have a diagnosis of ASD. It has also found the intervention to be successful for children with dual diagnoses including ADHD adding to the evidence that has found the intervention to be effective for children with social, emotional and/or behavioural difficulties (Toplis & Hadwin, 2006; Whitehead, 2007).

However, in contrast to earlier investigations which reported on the success of Social Stories for children with learning disabilities (Kalyva & Agliatis, 2009; Whitehead, 2007), the current study found the intervention to be ineffective for a child identified as having global learning difficulties.

The researcher would therefore argue that further evidence needs to be gathered before we can be certain as to the children the intervention is most likely to help. Adequate description of participants in relation to their cognitive and language ability, as well as initial behavioural screenings should be a key feature of any future research involving Social Stories (Reynhout & Carter, 2006).

### 5.6.3. Target Behaviours

This study offers further support for the use of Social Stories to address a range of target behaviours. As Gray (2000) has claimed, stories have been used effectively to: explain routines; describe social situations; teach social skills and deal with difficult behaviours. At present, there appears to be an absence of evidence to support the use of Social Stories for teaching academic skills although Gray (2000) suggest that they can be utilised for such a purpose. Future research into the appropriateness of the intervention to develop academic skills would be beneficial.

### 5.6.4. Story Construction

In their reviews of the existing literature on Social Stories, Ali & Frederickson (2006) and Reynhout & Carter (2006) identified that there was a gap in the research relating to the critical components of Social Story construction and implementation. This study examined one of these components by exploring the effectiveness of Social Stories with 'photograph' or 'symbol' illustrations. The discovery that stories with photograph illustrations appeared to be associated with more successful outcomes than those with symbol illustrations is of interest and warrants further investigation. As research has found that children with ASD have difficulties relating other people's drawings to real world objects but not in relating their own (Allen, 2009), it would seem to be important that future studies seek to evaluate the effectiveness of Social Stories incorporating children's own illustrations. Additional studies utilising symbol illustrations that have been chosen by and / or discussed and 'decoded' with children prior to story construction might also help to uncover whether the critical issue is children's understanding of symbol-referent relations or the nature of the images themselves.

Further examination will be necessary in order to identify the key components of effective Social Story constructio (Reynhout & Carter, 2006) and in particular, it is essential that Gray's (2000) claims are investigated to ascertain the importance of adherence to her 'basic Social Story ratio'. All of the stories included in this study followed Gray's (2000) guidelines, but to date, there is no theoretical or empirical rationale underpinning their value (Kuoch & Mirenda, 2003). The recent study by Quirmach et al (2009) suggested that directive sentences may be the 'active ingredient' in Social Stories whilst Reynhout & Carter (2006) found 'preliminary evidence' that consequence sentences might be pivotal. Future research investigating the impact of specific sentence types would help to clarify the role each plays in Social Story interventions.

With the rapid increase of multimedia approaches in education it is important that researchers consider how technology can be utilised to support the development of Social Stories. As Hagiwara & Myles (1999) explain, computer generated Social Stories could be advantageous as once a child has learned

how to access the story, there is no need for additional adult support to implement the intervention. Those studies that have investigated the efficacy of computer based stories (Hagiwara & Myles, 1999; Richmond-Mancil et al, 2009; Sansosti & Powell-Snith, 2008; Smith, 2001) have found the method to be successful and the one study that has compared the effect of PowerPoint™ and paper based Social Stories found that outcomes were slightly better for those presented on the computer (Richmond-Mancil et al, 2009). Video, DVD (O'Connor, 20009; Scattone, 2008) and audio recorded (Kalyva & Agaliotis, 2009) Social Stories have also proven to be effective. Future research should explore the use of a range of multimedia approaches for developing and presenting Social Stories to children as they provide new opportunities for engaging children with ASD and utilising their visual skills (Richmond-Mancil et al, 2009).

### 5.6.5. Story Implementation

Questions remain about the factors that are associated with successful Social Story delivery. In the current study, each story was read to the participant by a member of teaching staff. This was specified in order to control additional variables and to ensure that all children, irrespective of their age and reading ability were able to access the intervention. Of the studies reviewed, several involved adults reading the stories whilst in others children read the stories themselves with adult supervision. Future research will need to determine whether whoever reads the story makes any difference to the outcome of the intervention.

A related issue is that of reading comprehension. Previous studies have indicated that increased comprehension of Social Stories is associated with more positive outcomes (Reynhout & Carter, 2006). It was for this reason that the researcher asked teaching staff to ask simple comprehension questions following the first reading of the Social Story to ensure children's understanding. An examination of the impact of increased comprehension on Social Story efficacy would help to inform not only issues of implementation and delivery but also to identify those children who would be likely to benefit most from the intervention.

A further question that arose from the current research relates to the duration of exposure to the Social Story. In order to conduct a controlled experiment, all of the children within this study were exposed to the story for just two weeks, with the story being read on a daily basis during the first week and on every other day during the second week. Whilst for nine of the ten children involved in the project the length of exposure to the intervention resulted in successful outcomes, one of the teachers suggested that reading the story on a more regular basis and for a longer period of time would have been beneficial:

*"I think the social story would work well if it was read on a more regular basis."*
Participant 2

Teachers in the current study were given the freedom to use prompts if they felt that providing them would support the child. Whilst, many would argue for more rigorous controls, the researcher believed that it was important to leave the decision to prompt at the discretion of the teacher in order to promote ecological validity. Teachers' daily practice involves them identifying the needs and developing the skills of the children in their care and as such it is likely that they will instinctively prompt and support children when they deem it to be appropriate or necessary. To expect teachers to withhold from engaging in practices that promote the well being and development of children would not only have compromised the ecological validity of the findings but also have raised significant ethical issues. Furthermore, as Cohen (2007) asserts, it is crucial to incorporate as many contextual elements as possible for ecological validity to be demonstrated.

Reynhout & Carter (2006) suggested that studies evaluating Social Stories should be widened to include measures of maintenance and generalization. With this in mind, the frequency of target behaviours was taken two weeks following the withdrawal of the Social Story to see if any gains had been maintained. Findings revealed that the stories continued to be effective a fortnight after the intervention had ceased and for many children levels of target behaviour had not just remained low but had continued to decline. It would have

been interesting to have identified whether findings would have been similar if measures of behaviour had been taken after a more prolonged period, as two weeks is relatively short. It was not possible to do this within the time constraints of this project but future studies could investigate for how long these newly acquired skills are retained. The researcher did not specifically investigate issues of generalisation. As Social Stories are used to enable children to learn about specific social situations (Gray, 1994) it is debateable to what extent it is appropriate to assess whether skills have been generalised to other contexts. Gray herself argues that the intervention is not intended to equip the child with general skills or to universally change behaviour.

Whilst the researcher would assert that Social Stories need not promote the generalisation of skills to be successful, studies investigating their ability to promote learning across contexts would provide additional information as to the potential application of the intervention.

Finally, the researcher would argue that for any intervention to be deemed to be effective they must be socially acceptable. As such, it is crucial that Social Story research incorporates measures of social validity in order to determine stakeholders' perceptions of their effectiveness and ease of implementation. The findings of this study revealed that 70% of the teachers rated Social Stories at 7 or above and 20% of teachers rated them at 10 on a rating scale for ease of implementation, where 10 indicated that the intervention was 'very easy' to implement. Moreover, 100% of the teachers stated that they would consider using a Social Story intervention again.

These findings are consistent with the results of previous studies which suggested that teachers and pupils considered Social Stories to be worthwhile, effective and easy to deliver (Barry & Burlew, 2004; Crozier & Tincani, 2007; Hagiwara & Myles, 1999; Quimbach et al, 2009; Rowe, 1999; Scattone et al, 2002; Schneider & Goldstein, 2009; Smith, 2001; Toplis & Hadwin, 2006; Whitehead, 2007).

Perhaps most importantly, whilst children were not consulted directly, comments reveal that they enjoyed the stories:

*"He loved his book and the photos."* Participant 5

## 5.7. Implications for EP Practice

The research that has been conducted to date suggests that there is a growing evidence base supporting the use of Social Stories for addressing the target behaviours of children who have a diagnosis of ASD. As such, EPs and other professionals can be increasingly confident in implementing and recommending the approach during the course of their practice. That is not to say that findings have been entirely unequivocal or indeed to overlook the limitations of the studies that have been conducted to date, but it is an acknowledgement that the current evidence is extremely encouraging. As such the researcher would agree with Ali & Frederickson (2006, page 372) in concluding that "there is a sufficient evidence base to suggest that the approach has promise and warrants further research."

It is not yet clear from the research what they key components of effective Social Story construction and implementation are and for which children EPs should be recommending them but If these issues can be clarified then the positive views expressed by the researcher as to the effectiveness of the intervention are of great consequence to EPs. The significance lies in the fact that Social Story interventions draw upon recognised aspects of 'best practice' for EPs as identified in the Division of Educational & Child Psychology (DECP): Professional Practice Guidelines (BPS, 2002).

If research continues to provide evidence to support the effectiveness of Social Stories then EPs can be confident that in recommending them they will be adhering to the DECP guidelines (BPS, 2002) by promoting positive outcomes for children and young people. Whilst there is a need for further investigation into children's views on the intervention, where views have been sought, the

majority of comments have been most favourable. Furthermore, the stories are considered to be easy to implement, convenient, unobtrusive and less time consuming than other interventions. These findings are crucial, as if teachers believe Social Stories to be an effective and practical intervention they are more likely to implement them. Additionally, the DECP guidelines (BPS, 2002) assert that EPs should consider the use of the least intrusive interventions before embarking on more intrusive course of action providing support for discrete strategies such as Social Stories.

The views of both the children and the adults involved in the intervention exemplify the fact that Social Story interventions are built on partnership (Ali & Frederickson, 2006). They involve not only the child but also the adults who support them in identifying the focus for the story, in developing the story, in delivering the story and in evaluating outcomes. DCEP guidelines (BPS, 2002) explain that EPs should adhere to the principles of the Children Act (1989) in providing support not only for children and young people but also for those adults who are responsible for their welfare. In working collaboratively Social Stories have the potential not only to increase awareness and change the behaviours of children (Gray, 1994) but also to promote awareness and behaviour change in the adults who work with them (Smith, 2001).

In order to increase EPs confidence in recommending the approach, future research of the nature referred to in the previous section (5.3.) will need to be carried out. With the growing drive for evidence-based practice, the need to promote best practice and ensure accountability (Stoiber & Kratochwill, 2000), practitioners must ensure that the approaches and methods they adopt and promote are drawn from the best available research and knowledge of intervention outcomes (Dunsmuir, Brown, Iyadurai & Monsen, 2009). EPs have an important part to play in contributing to this research base, embracing their role as scientist practitioners and becoming not only the users of research but researchers in their own right (Frederickson, 2002).

As Dunsmuir et al (2009) imply there can be pragmatic difficulties with embedding research into daily working practices. 'Gold standard' RCT designs

which are considered to provide the most readily acceptable evidence of the effectiveness of interventions (Harrington, Cartwright-Hatton & Stein, 2002) can be difficult to implement in 'real world' settings and Frederickson (2002) argues that their use in such contexts may be ethically questionable. Such difficulties should not deter EPs from undertaking evaluative research. Ali & Frederickson (2006) suggest that single case experiments can realistically be applied to EP practice during the course of casework and where data collection protocols have been developed, studies could be replicated and research data could be aggregated in order that information about the characteristic features of successful interventions could be obtained. If EPs were to follow Smith's (2001) lead in evaluating the outcomes of 'Social Story' training for both the adults who attended and the children and young people who subsequently received the intervention, there would be the potential of obtaining a wealth of information. If attendees were simultaneously trained in data collection then multiple SCEDS and control group designs could be undertaken (Ali & Frederickson, 2006).

# CHAPTER 6: CONCLUSION

## 6.1. The Valuable & Original Contribution of this Research

The present study has provided additional evidence to support data obtained from several earlier studies (see section 2.9.1. for a list of references) that indicate that Social Stories can be an effective intervention for addressing the target behaviours of children and young people with a diagnosis of ASD. Furthermore it has extended these findings by identifying levels of skills maintenance for some children a fortnight after the stories have been withdrawn.

The study made a unique contribution to the literature in exploring the differential effectiveness of Social Stories with either photograph or symbol illustrations finding tentative evidence to suggest that photograph illustrations appear to be associated with more successful maintenance outcomes.

## 6.2. Next Steps

### 6.2.1. Dissemination & Impact of this Research

If this research study is to contribute effectively to the existing evidence-base on Social Stories then it is vital that the findings are disseminated. In determining the most appropriate method for dissemination the researcher will need both the medium for delivery and the key audience both locally and nationally. Such an audience should include all those who are involved with supporting children with ASD and children who present with social, emotional and behavioural needs (Educational Psychologists; fellow professionals; school staff; parents and carers) in order that the findings can be used to develop appropriate interventions.

### 6.2.2. Future Research

Although the study has made a potentially significant contribution, uncertainties remain as to what are the key components of effective Social Story construction and implementation and for the exact profile of children for whom they are successful. Bearing in mind the popularity and widespread use of Social Story interventions and the positive tenet of the existing literature, there is a clear need for further investigation to answer the questions that remain unanswered.

### 6.2.3. Educational Psychology Practice

As scientist-practitioners who are involved in the delivery of support to children, young people, their families and schools, EPs should be at the forefront of investigations evaluating the effectiveness of interventions, utilising their research skills to undertake discrete projects and to inform casework. This study accords with the views of Ali & Frederickson, (2006), that SCED studies offer practitioners an effective way of combining research with their everyday working practice and ultimately contributing to the development of an evidence base which can be drawn upon to promote positive outcomes for children and young people.

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Wright, L. A. (2009). Utilizing Social Stories to reduce problem behaviour and increase pro-social behaviour in young children with autism. *Dissertation Abstracts International Section A: Humanities & Social Sciences,* 70(3-A), 843.

Zins, J. E., Kratochwill, T. R. & Elliott, S. N. (1993) (Eds.), *Handbook of consultation services for children: Applications in educational and clinical settings*. San Francisco: Jossey-Bass.

## WEBSITES

www.nas.org.uk a: www.autism.org.uk/about-autism/some-facts-and-statistics.aspx

www.nas.org.uk b: www.autism.org.uk/living-with-autism/approaches-therapies-and-interventions/skills-based-interventions/social-stories-and-comic-strip-conversations.aspx

www.bps.org.uk: www.bps.org.uk/careers/what-do-psychologists-do/areas/educational.cfm#become

www.sdqinfo.com

# APPENDICES

# APPENDIX A

## DSM-IV Diagnostic Criteria

# DSM-IV: Diagnostic categories

## 299.00 Autistic disorder

Individuals with this disorder have abnormal functioning in at least one of the following areas, with onset before 3 years of age 1) social interaction, 2) language as used in social communication, or 3) symbolic or imaginative play. The diagnosis also requires:

A. A total of 6 (or more) items from (1), (2) and (3), with at least 2 from (1) and one each from (2) and (3):

1: qualitative impairment in social interaction, as manifested by at least two of the following:

(a) marked impairment in the use of multiple non-verbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction;

(b) failure to develop peer relationships appropriate to developmental level;

(c) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by a lack of showing, bringing, or pointing out objects of interest);

(d) lack of social or emotional reciprocity.

2: qualitative impairments in communication as manifested by at least one of the following:

(a) delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime);

(b) in individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others;

(c) stereotyped and repetitive use of language or idiosyncratic language;

(d) lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level.

3: restricted, repetitive and stereotyped patterns of behaviour, interests and activities, as manifested by at least one of the following:

(a) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus;

(b) apparently inflexible adherence to specific, non-functional routines or rituals,

(c) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting or complex whole body movements);

(d) persistent preoccupation with parts of objects.

## 299.80 Rett's disorder

Individuals with this disorder develop normally for the first 5 months of life, followed by a deceleration of head growth (between 5 and 48 months), loss of previously acquired purposeful hand movement (between 5 and 30 months), loss of social engagement, development of poorly coordinated gait or trunk movements, and severely impaired expressive and receptive language development with severe psychomotor retardation.

## 299.10 Childhood disintegrative disorder

Individuals with this disorder develop normally for the first two years and then demonstrate a significant loss of previously acquired skills in two of the following areas: expressive or receptive language, social skills, bowel or bladder control, play, or motor skills. They also have abnormalities of functioning in two of the following: social interaction; communication; and restricted, repetitive, and stereotyped patterns of behaviour, interests, and activities such as those described in the criteria for autistic disorder.

## 299.80 Asperger's disorder

Individuals with this disorder fulfil criteria A and B below but lack any clinically significant delay in language or cognitive development.

A: qualitative impairment in social interaction, as manifested by at least two of the following:
(1) marked impairment in the use of multiple non-verbal behaviours such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction;
(2) failure to develop peer relationships appropriate to developmental level;
(3) a lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g. by a lack of showing, bringing, or pointing out objects of interest);
(4) lack of social or emotional reciprocity.

B: restricted, repetitive and stereotyped patterns of behaviour, interests and activities, as manifested by at least one of the following:
(1) encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus;
(2) apparently inflexible adherence to specific, non-functional routines or rituals,
(3) stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting or complex whole body movements);
(4) persistent preoccupation with parts of objects.

## 299.80 Pervasive developmental disorder not otherwise specified

Individuals with this disorder may have severe and pervasive impairments in reciprocal social interactions and communication skills or may develop stereotyped behaviour, interests, or activities, but the criteria for a specific pervasive developmental disorder are not met.

# APPENDIX B

A table providing an overview of each of the 29 studies included in the systematic literature review detailing information about participants, methodology / design, target behaviours, procedure / intervention and results

## 2.9. Synthesis of the literature

Figure 2.9.1 provides an overview of each of the studies that have been included in the systematic literature review detailing information about participants, methodology / design, target behaviours, procedure / intervention and results.

| Study | Participants | Methodology / Design | Target Behaviours | Procedure / Intervention | Results |
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| Swaggart, B; Gagnon, E; Bock, S J; Earles, T. L; Quinn, c; Myles, B.S. & Simpson, R.L. (1995). Using social stories to teach social and behavioral skills to children with autism. *Focus on Autistic Behavior, 10(1), 1-16.* | Three children aged from 7 – 11.<br>One boy with pervasive developmental disorder.<br>One boy and one girl with autism.<br>All participants had limited expressive language skills. | Single Case Experiment.<br>AB design. | Child 1 - increase appropriate greeting behaviours, decrease touching, aggression and ignoring.<br>Child 2 & 3 – increase sharing and parallel play, decrease aggression and screaming (Child 2) and grabbing (Child 3). | 4 Social Stories (2 adhering to Gray's basic Social Story formulation).<br>Social Stories read by teacher / teaching assistant.<br>No comprehension session.<br>Use of visual symbols.<br>Social Stories combined with verbal prompting, physical prompting and a response-cost behavioural system. | Results from observations:<br>Child 1 - increase in appropriate greeting (7% - 74%), decrease in touching (82% - 26%) and in aggression (9% - 0%).<br>Child 2 - increase in sharing (0% - 22%) and in parallel play (80% - 94%), decrease in aggression (30% - 6%) and screaming (100% - 56%).<br>Child 3 – increase in sharing (0% - 35%) & parallel play (80% - 94%), decrease in aggression (20% - 6%) & grabbing (100% - 35%).<br>Limited generalisation<br>Maintenance not reported. |

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| Kuttler, S; Myles, B. S & Carlson, J. K. (1998). The use of social stories to reduce precursors to tantrum behavior in a student with autism. *Focus on Autism and Other Developmental Disabilities, 13(3), 176-182.* | One 12 year old boy with autism, fragile x, intermittent explosive disorder. Limited communication skills. | Single Case Experiment. ABAB design. | Precursors to tantrum behaviour e.g. inappropriate vocalisations, dropping to floor. | 2 Social Stories (1 adhering to Gray's basic Social Story formulation). Social Stories read by teacher.No comprehension session. Use of visual symbols. Social Stories combined with visual timetables, verbal and physical prompting and sticker/prize bag reinforcers. | Results from observations (interobserver reliability scores calculated): Decrease in precursors to tantrum behaviour when Social Stories were available and an increase in the targeted behaviour when the intervention was withdrawn. Maintenance not reported. |
| Rowe, C. (1999). Do social stories benefit children with autism in mainstream primary schools. *British journal of Special Education,* 26(1), 12-14. | One 6 year old boy with Asperger's syndrome who was experiencing considerable difficulties with social interaction and communication, could be distracted by visual stimuli, responded adversely to specific sounds and commented that certain noises 'hurt' his ears. | Descriptive Case Study. | Refusal to enter the dinner hall at lunchtime, shouting out about the noise and saying that it was disgusting when others ate with their mouths open. | 1 Social Story adhering to Gray's basic Social Story formulation. Story read by the child and teacher. No comprehension session. No mention of visual symbols. Story combined with verbal prompting. | Classroom observations and Interviews revealed that after the first reading the child ate his lunch in the dining hall and this appropriate behaviour has continued ever since. Appropriate behaviours generalised to other situations |

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| Hagiwara, T. & Myles, B.S. (1999). A multimedia social story intervention: Teaching Skills to Children with Autism. *Focus on Autism and Other Developmental Disabilities,* 14 (2), 82-95. | Three children aged from 7 – 9 with autism - diagnosis based on scores of 108, 96 and 82 obtained with Autism Behavior Checklist (ABC).<br><br>Scores on the Psychoeducational Profile Revised (PEP-R) indicated developmental ages of 36, 26 and 40 months.<br><br>All participants showed mild to moderate social skill problems and basic listening or written language skills. | Single Case Experiment. Multiple baseline across settings. | Child 1 & 2 - to be able to wash their hands independently.<br><br>Child 3 - to exhibit on-task behaviour e.g. reading aloud, making eye contact with teachers and making task related comments. | 3 Social Stories presented using a computer-based format which didn't adhere to Gray's basic Social Story formulation. No comprehension session.<br><br>Use of visual symbols.<br><br>Social Story combined with verbal prompting and physical assistance. | Results from observations revealed (interobserver reliability calculated):<br><br>Child 1 - hand washing improved across all settings and he showed generalisation of the newly acquired skill in one setting.<br><br>Child 2 - demonstrated improvements in newly acquired skills in 2 settings.<br><br>Child 3 - partial improvements in on-task behaviours in 2 settings.<br><br>Maintenance not reported. |
| Smith (2001). Using Social Stories to Enhance Behaviour in Children with Autistic Spectrum Difficulties. *Educational Psychology in Practice,* 17(4), 337-345. | Nineteen children from Key Stages 1, 2 & 3. Fifteen with a diagnosis of ASD, four who school described as experiencing learning difficulties (two children), tourettes syndrome (one child), semantic pragmatic difficulties (one child). | Group case study. | Variety of behaviours - managing dangerous behaviour, complying with school/home conventions, self help skills etc. | 18 Social Stories adhering to Gray's basic Social Story formulation, 1 using the advanced story format. Variety of written and computer-presented Social Stories. | Post intervention ratings of change were taken.<br>Stories were rated in terms of how effective they were seen to be on a scale from 1 (not at all) to 10 (completely). 16 of the stories were rated above the mid point on a scale with 13/19 achieving a rating between 7 and 10. |

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| Thiemann, K. S., & Goldstein, H. (2001). Social Stories, Written Text Cues and Video Feedback: Effects on Social Communication of Children with Autism. *Journal of Applied Behavior Analysis, 34, 425-446.* | Five boys aged from 6 – 12 with autism (diagnosis based on CARS scores), with impaired social communication, emerging / acquired word identification skills and functional verbal communication. | Single Case Experiment. Multiple-baseline across behaviours. | Securing attention, initiating comments, initiating requests, topic changes, unrelated responses and no responses. | 4 Social Stories adhering to Gray's basic Social Story formulation.<br>Social Story read by the child with help from the teacher or peers. No comprehension questions were asked.<br>Use of visual symbols.<br>Social Stories combined with verbal prompting, direct social skills instruction involving written text cues and self-evaluation video feedback. | Results from observations revealed (interobserver reliability calculated): Improvements in reciprocal social behaviours between target pupils and their peers. |
| Scattone, D., Wilczynski, S.M., Edwards, R.P. & Rabian, B. (2002). Decreasing Disruptive Behaviors of Children with Autism Using Social Stories. *Journal of Autism & Developmental Disorders,* 32(6), 535-543. | Three boys aged 7 – 15 years with autism who were capable of communicating using speech. | Single Case Experiment. Multiple-baseline across participants. | Child 1- tipping his chair backwards or sideways.<br>Child 2 - shouting out during maths.<br>Child 3 - staring inappropriately at girls during registration. | Three Social Stories (2 adhering to Gray's basic Social Story formulation).<br>2 children read their own Social Stories, the teacher read the other.<br>Comprehension session included.<br>Social Stories combined with verbal prompting and an intervention to increase on task behaviour. | Results from observations revealed (interobserver reliability calculated): Reduction in disruptive behaviours:<br>Child 1 – from mean of 50% to 4.6%.<br>Child 2 – from mean of 66.9% to 18.25%.<br>Child 3 – from 18.15% to 5.1%. |

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| Bledsoe, R., Myles, B.S. & Simpson, R.I. (2003). Use of a Social Story intervention to improve the mealtime skills of an adolescent with Asperger syndrome. *Autism.*, 7 (3), 289-295. | One boy aged 13 with Asperger's syndrome and ADHD. Full scale IQ of 82. | Single Case Experiment. ABAB design. | Eating related problems e.g. spilling food, drink and failure to wipe food from his face. | One Social Story adhering to Gray's basic Social Story formulation.<br>Social Story read by researcher. No comprehension session.<br>Social Stories combined with photos of peers and the participant demonstrating appropriate eating behaviours. | Results from observations revealed (interobserver reliability calculated):<br>Reduction in food spillages from a median frequency of 4.0 – 2.0 after the introduction of the story and from 3.0 – 1.0 in the second phase.<br>Increase in face wiping from no wiping to once after the introduction and from no wiping to once in the second phase. |
| Kuoch, H., & Mirenda, P. (2003). Social story interventions for young children with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 18(4) 219-227.* | Three boys aged 3 – 6 with autism. | Single Case Experiment. ABA for Child1 & 2 and ACABA for Child 3. | Child 1- hitting, pinching, kicking & yelling.<br>Child 2 – placing hand in paint, making sounds and throwing up.<br>Child 3 – cheating on games. | Three Social Stories adhering to Gray's basic Social Story formulation.<br>Social Stories read by teacher. No comprehension session.<br>Use of visual symbols.<br>Social Stories combined with verbal prompting. | Results from observations revealed (interobserver reliability calculated):<br>Child 1 & 2 – decrease in rate of problem behaviours on intervention and good rate of maintenance.<br>Child 3 – decrease in the rate of problem behaviour and good rate of maintenance. |
| Barry, L. M & Burlew, S. B. (2004). Using Social Stories to Teach Choice and Play Skills to Children with Autism. *Focus on Autism and Other Developmental Disabilities, 19(1), 45-51.* | Two children aged 7 & 8 with severe autism and little or no language skills. | Single Case Experiment. ABCD Multiple-baseline across-participants design. | Learning how to make activity choices, play appropriately with materials chosen and play appropriately with peers. | Social Stories combined with visual timetables and verbal prompts. | Results from observations revealed:<br>Both children demonstrated increased rates of appropriate behaviour. |

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| Ivey, M. L; Heflin, L. J & Alberto, P. (2004). The Use of Social Stories to Promote Independent Behaviors in Novel Events for Children with PDD-NOS. *Focus on Autism and Other Developmental Disabilities, 19(3), 164-176.* | Three children aged from 5 – 7 with pervasive developmental disorder. | Single Case Experiment. ABAB design. | Independent participation during novel events demonstrated by remaining on task, using key skills and making a request. | Social Stories were read at the beginning of Speech & Language Sessions to prepare the children for novel events within those sessions. | Results from observations revealed:<br>Data indicated that the use of Social Stories produced a 15% to 30% increase in participation during novel events for all 3 children. |
| Delano, M & Snell, M. E. (2006). The effects of social stories on the social engagement of children with autism. *Journal of Positive Behavior Interventions, 8(1), 29-42.* | Three elementary school age children with autism. | Single Case Experiment. Multiple-baseline across-participants design. | Seeking attention, initiating comments, initiating requests and making contingent responses during play sessions. | Social Stories and comprehension questions followed by 10 minute play sessions.. | Increases in the duration of social engagement and the frequency of specific social skills. |
| Sansosti, F. J & Powell-Smith, K. A. (2006). Using social stories to improve the social behavior of children with Asperger syndrome. *Journal of Positive Behavior Interventions, 8(1), 43-57.* | Three children with ASD. | Single Case Experiment. Multiple-baseline across-participants design | Target behaviours occurring during unstructured times (recess). | Social Stories were implemented and direct observations of the participants identified target behaviours were conducted three times per week during unstructured school activities. | Observations suggested that 2 of the children in the study benefited from the Social Story intervention but there was a failure to demonstrate skill maintenance and poor results were recorded for one participant. |

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| Toplis, R., & Hadwin, P. (2006). Using Social Stories to Change Problematic Lunchtime Behaviour in School. *Educational Psychology in Practice., 22 (1) 53-67.* | Five Year 2 children with a mean age of 7 years 5 months who were reported to have behavioural difficulties. All of the children were required to have level 2 in Literacy and Numeracy and they had a mean reading age of 7 years and 2 months on the British Ability Scales (BAS II) Word Reading Test. | Single Case Experiment. ABAB design. | Lunchtime behaviour. | Children's own drawings of lunchtimes, teachers descriptions of behaviour and observations were used to inform the stories and they were written adhering to Gray's basic Social Story formulation including colour icons.<br>Stories were read to the children prior to lunchtime and the children could access the stories at other times. | Results from observations revealed:<br>An increase in targeted behaviour when Social Stories were used for 3 out of the 5 children. The profile of results from the CTRS-R and social cognitive tasks indicated that Social Stories were an effective intervention for children who had poor social skills and difficulties understanding the perspective of others. |
| Crozier, S. & Tincani, M. (2007). Effects of Social Stories on Prosocial Behaviour of Preschool Children with Autism Spectrum Disorders. *Journal of Autism & Developmental Disorders,* 37, 1803-1814. | Three preschool children aged from 3 - 5 with ASD:<br>Child 1 - below average risk for autism on the Gilliam Autism Rating Scale but the psychologist determined that he exhibited sufficient ASD characteristics to warrant the diagnosis<br><br>Vinelaand Adaptive Behaviour Scales standard scores<br>Communication 76<br>Socialisation 73<br>Adaptive behaviour 69. | Single Case Experiment.<br><br>Children 1 & 3 – ABAB.<br><br>Child 2 – ABCACBC multi-component reversal design. | Child 1 - sitting appropriately during morning circle.<br><br>Child 2 - talking with his peers during snack time.<br><br>Child 3 - appropriate play with peers. | Social Stories were based on information obtained from the teachers. They were written adhering to Gray's basic Social Story formulation including colour icons.<br>Stories were read by the authors immediately prior to the target activity and observation period.<br>Comprehension questions asked.<br><br>Children 1 & 3 - only received Social Stories.<br><br>Child 2 - received Social | Results from observations were variable:<br>Child 1 - the Social Story was effective in promoting the target behaviour and maintenance after 2-3 weeks was high.<br>Child 2 - the Social Story was effective in promoting appropriate communication with peers but these behaviours were not maintained.<br><br>Child 3 - the Social Story had little impact.<br><br>When the Social Story was accompanied with prompts higher |

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| | Child 2 – his Autism Diagnostic Observation Schedule total score was 11 (ASD cut off 7, Autism cut off 12)<br>Vinelaand Adaptive Behaviour Scales standard scores<br>Communication 81<br>Socialisation 76<br>Adaptive behaviour 74.<br><br>Child 3 – high functioning autism, strong expressive language but poor receptive language skills. | | | Story and verbal prompts. | levels of the target behaviour were recorded and lower levels were maintained following completion of the intervention. |
| *Reynhout, G & Carter, M. (2007). Social Story Efficacy with a Child with Autism Spectrum Disorder and Moderate Intellectual Disability. Focus on Autism & Developmental Disabilities, 22 (3), 173-182.* | One 8 year old child with severe autism, moderate intellectual disability and associated language impairment. | Single Case Experiment. ABC design. | Tapping of hands during reading. | A - Baseline phase (no Social Story).<br>B - Social Story was read prior to the observation session then left for the child to access independently .<br>C - Social Story was read prior to the observation session then left for the child to access independently and for the teacher to review with the student. | Results from observations:<br>There was an increase in the target behaviour and this was associated with increased comprehension of the story.<br>Findings suggest that it is appropriate to consider language skills when evaluating the suitability of this intervention for students with moderate intellectual disabilities and to monitor comprehension. |

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| Whitehead, J. (2007). Telling It Like It Is: Developing Social Stories for Children in Mainstream Primary Schools. *Pastoral Care, 25 (4) 35-41.* | Eight non-autistic children in Year 4 in a mainstream primary school who had been identified as having some deficit in social, emotional and/or behavioural skills. One pupil had a statement of Special Educational Needs for a diagnosis of global developmental delay and moderate learning difficulties. | Case Study. | Personal organisation skills, inattentiveness, fighting in the playground, unawareness of the effect of vocalisations, disrupting other children in lessons. | Social Stories were written adhering to Gray's basic Social Story formulation and were individualised using photographs, drawings and symbols. Stories were read on a daily basis before target situations and comprehension questions were asked. Social Stories combined with other behavioural strategies. | Interviews with the children and teaching staff indicated that the Social Story was very effective for the child with moderate learning needs who had difficulties considering other peoples feelings. Interviews revealed that setting up an effective story can be time consuming. |
| *Chan, J.M. & O'Reilly, M.F. (2008). A Social Stories Intervention Package for Students with Autism in Inclusive Classroom Settings. Journal of Applied Behavior Analysis., 41 (3), 405-409* | Two children aged 5 and 6 with autism and language skills deemed to be appropriate for a Social Story intervention. | Single Case Experiment. Multiple-baseline across-behaviour design. | Child 1 - inappropriate social interactions, appropriate hand raising, inappropriate vocalisations. Child 2 - appropriate hand raising, appropriate social initiations, inappropriate vocalisations. | 6 Social Stories were written adhering to Gray's basic Social Story formulation. Children read the social stories, answered comprehension questions and participated in role play during every intervention session. | Results from observations revealed: Social Stories intervention packages increased appropriate behaviours and decreased inappropriate behaviours for both children. Effects were maintained for up to 10 months. |

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| Ozdemir, S. (2008). The Effectiveness of Social Stories on Decreasing Disruptive Behaviours of Children with Autism: Three Case Studies. . *Journal of Autism & Developmental Disorders, 38, 1689-1696.* | Three boys aged 7 - 9 with ASD<br>Who were capable of communicating orally and demonstrated pre-reading or beginning reading skills:<br>Child 1 – mild autism Childhood Autism Rating Scales (CARS).<br>Child 2 – mild autism (CARS).<br>Child 3 – mild autism (CARS). | Single Case Experiment. Multiple-baseline across-participants design. | Child 1 - using a quiet voice in class.<br><br>Child 2 - tipping his chair backward or sideways.<br><br>Child 3 - waiting in line to get his lunch. | Social Stories were written adhering to Gray's basic Social Story formation.<br><br>Children's own pictures were used along with photographs .<br><br>Stories were read by child, teacher or teaching assistant before target situations. | Results demonstrated a significant reduction of targeted disruptive behaviours compared to baseline performance.<br><br>Maintenance data showed that as the intervention faded levels of disruptive behaviour remained significantly lower than during baseline performance.<br><br>Teachers reported favourable opinions of social stories. |
| Sansosti, F.J. & Powell-Smith, K.A. (2008). Using computer-presented social stories and video models to increase the social communication skills of children with High-Functioning Autism Spectrum Disorders. *Journal of Positive Behavior Interventions, 10 (3), 162-178.* | Three children with high functioning autism and Asperger's syndrome. | Single Case Experiment. Multiple-baseline across-participants design. | Social communication. | Computer-presented Social Stories and video models were implemented and direct observations of the participants identified target behaviours were collected. | Results indicate that the combined treatment package was effective in improving the rates of social communication for the participants. |

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| *Scattone, D. (2008). Enhancing the Conversation Skills of a Boy with Asperger's Disorder through Social Stories and Video Modelling. Journal of Autism & Developmental Disorders, 38 (2), 395-400.* | One 9 year old boy with ASD.<br>Kaufman Intelligence Test (KBit)<br>Vocabulary Score = 117<br>Matrices Score = 99<br>Composite IQ = 109.<br>Weschler Individual Achievement Test (WIAT)<br>Basic Reading Score = 126<br>Numerical Operations Score = 114 | Single Case Experiment.<br>Multiple-baseline across-behaviours design. | Conversational skills. | Treatment consisted of an observation of video taped social stories that included two adults modelling targeted conversational skills and 5 min social interactions.<br><br>Social Stories were written adhering to Gray's basic Social Story formation. | Increase in 2 out of 3 targeted conversational skills.<br><br>Generalised behaviour changes observed. |
| Scattone, D., Tingstrom, D. H. & Wilczynski, S.M. (2008). Increasing Appropriate Social Interactions of Children With Autism Spectrum Disorders Using Social Stories. *Focus on Autism & Other Developmental Disabilities,* 21(4), 211-222. | Three children with ASD. | Single Case Experiment.<br>Multiple-baseline design. | Appropriate social interactions. | Social Stories as a sole intervention. | Results from observations revealed:<br>Increase in appropriate social interactions for 2 out of the 3 participants. |

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| Kalyva, E. & Agaliotis, I. (2009). Can Social Stories enhance the interpersonal conflict skills of children with LD? *Research in Developmental Disabilities, 30, 192-202.* | Thirty one children with learning difficulties. | Randomised Controlled Experiment. | Interpersonal conflicts. | Experimental Group - received recorded social story twice a week for a month. Control group - did not receive any intervention.<br><br>Interviews and T-MESSY used to evaluate social skills. Interviews- children asked questions relating to interpersonal conflicts using the measure devised by Agaliotis and Goudiras (2004). They were read a short description of an interpersonal problem and then asked questions about how the main character might respond to the problem. | Before the intervention all children chose avoidance and hostile strategies. After the intervention and during follow-up children in the experimental group chose predominantly positive strategies in contrat to the control group.<br><br>Children in the experimental group were rated by their teachers as engaging in significantly less inappropriate social behaviours after the intervention than the control.<br><br>Authors concluded that social stories constitute a powerful intervention for enhancing social competence in children with LD. |

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| Quirmbach, L.M., Lincoln, A.J., Feinberg-Gizzo, M.J., Ingersoll, B.R. & Andrews, S.M. (2009). Social Stories: Mechanisms of Effectiveness in Increasing Game Play Skills in Children Diagnosed with Autism Spectrum Disorder Using a Pretest Posttest Repeated Measures Randomized Control Group Design, *Journal of Autism and Developmental Disorders, 39, 299-321.* | 42 children ranging in age from 7-14 with a diagnosis of ASD assessed using the Autism Diagnostic Observation Schedule (ADOS) and the Wechsler Intelligence Scale for Children Fourth Edition (WISC-IV).<br><br>Participants had to have at least a first grade reading level on the Peabody Individual Achievement Test-Revised (PIAT- R) Reading Recognition and Reading Comprehension subtests. | Pre-test Post-test Repeated Measures Randomised Control Trial. | Game play skills. | Children were randomly allocated to receive either standard, directive or control social stories.<br>Standard stories were based on Feinberg's story format which was informed by feedback from educators and professors who had experience of writing Social Stories, including Carol Gray.<br>Directive stories used only the directive sentences from the original format.<br>Participants undertook 5 game play sessions over a 2 day period . Social Stories read on both days. Games play skills coded and recorded during play sessions by 3 raters (blind to the intervention) Measures of interobserver reliability taken. Assessments of generalisation a & maintenance taken. Comprehension questions. | Results demonstrated that the standard and directive Social Stories were equally effective in eliciting, generalising and maintaining the targeted social skills in participants who had prior game play experience and Verbal Comprehension Index (VCI) scores from the WISC-IV in the borderline range.<br><br>All 3 children showed improvements in on-task behaviour following the Social Story intervention and that these improvements were generalised to different contexts and maintained following the completion of the intervention. |

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| Abraham, J. A. (2009). Generalization effects of social story interventions for individuals with Asperger's disorder. *Dissertation Abstracts International: Section B: The Sciences & Engineering,* 70(2-B), 1328. | 4 children with a diagnosis of Asperger's disorder. | Multiple Baseline Across Participants design with counterbalancing of conditions across 2 pairs of participants. | Increasing appropriate behaviours. | Typical 'train & hope' written Social Stories were utilised and generalization tactics were specifically incorporated.<br><br>A multiple probe technique was used to assess generalization of skills. | During both the 'train & hope' format and the generalized format, appropriate behaviours increased for 3 of the 4 participants. Some generalization to similar settings occurred even using a 'train & hope' approach, but a greater behaviour change occurred when generalization was explicitly programmed. |
| Wright, L. A. (2009). Utilizing Social Stories to reduce problem behaviour and increase pro-social behaviour in young children with autism. *Dissertation Abstracts International Section A: Humanities & Social Sciences,* 70(3-A), 843. | Four children with a diagnosis of autism. | Multiple Baseline Across Participants design. Comparison with gender and age-matched peers. | Target behaviours and pro-social behaviour. | Written Social Stories were utilised. Pre and post measures of problem behaviours and pro-social behaviour were taken. | Results indicate that Social Stories were effective in increasing pro-social behaviour rates in 3 out of 4 children but none reached the pro-social behaviour rates of the gender and age-matched peers. Problem behaviours decreased with the intervention and maintenance of skills over a month period was demonstrated for all participants. |

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|---|---|---|---|---|---|
| O'Connor, E. (2009). The use of Social Story DVDs to reduce anxiety levels: a case study of a child with autism and learning disabilities. *Support for Learning*, 24(30), 133-136. | A primary aged child with a diagnosis of ASD and associated learning disability who received 1:1 support via his Statement of Special Educational Needs. | Case Study. | Turn taking. | Gray's Social Story DVD entitled 'Turn taking' was played to the child 15 minutes prior to each PE and swimming session and turn taking games involving a peer took place on the coach during the journey to the pool. A paper copy of the Social Story was used to prompt the child during sessions.<br><br>Observations were recorded over a three week period which incorporated baseline and intervention phases. | Whilst quantitative data has not been included, the Teaching Assistant reported that for swimming sessions the incidents of challenging behaviour had been reduced in terms of duration and intensity.<br><br>However, for PE lessons, the intervention proved to be unsuccessful which the author suggests means that the learned behaviour had not been generalised to other contexts. |
| Richmond Mancil, G., Haydon, T. & Whitby, P. (2009). Differentiated effects of paper and computer-assisted Social Stories™ on inappropriate behaviour in children with autism. *Developmental Disabilities,* 24(4), 205-215. | Three elementary students, two male and one female ranging in age from 6-9.<br><br>Participants had a diagnosis of ASD and performed comparably on assessment measures. | ABABCBC multicomponent reversal single subject design. | Pushing, grabbing, touching and shoving other children. | Social Stories written adhering to Gray's formation on paper format and in PowerPoint™. Questions asked to ensure comprehension. Stories read in the children's classrooms before lunchtime. Classroom personnel collected data utilising an event recording approach. Measures of interobserver agreement were taken. | Results indicated that the frequency of pushing in the classroom decreased for all participants during intervention.<br><br>Results were slightly better when Social Stories were presented using PowerPoint™ than in paper format. |

| | | | | | |
|---|---|---|---|---|---|
| Schneider, N & Goldstein, H (2009). Social Stories™ improve the on-task behaviour for children with language impairment. *Journal of Early Intervention, 31(3), 250-264.* | Three children, aged 6, 6 & 9 who<br>a) had language impairments;<br>b) received speech-language services,;<br>c) demonstrated problem behaviours<br>d) demonstrated impaired verbal and social communication but could communicate orally;<br>e) were not receiving intervention for the problem behaviour. | Single Case Experiment. Multiple-baseline across-participants design. | On-task behaviours. | Teachers, Speech-language Pathologists, parents and the author provided information about potential behaviours to be targeted for intervention. Teachers were blind to the transition from Baseline to Intervention as children were removed from the targeted routine each day during the Baseline phase and read a random selection of children's story books. Each Social Story was then read during the Intervention phase. Social Stories were written adhering to Gray's basic Social Story formation and contained picture icons. Comprehension questions asked. On and off task behaviours were identified and recorded every 15 seconds for a 5 min period 5 times a week. Measures of Interobserver agreement taken. | Results indicate a large effect size and suggest that Social Stories might be an effective strategy for increasing on-task behaviour for children with impaired language. |

# APPENDIX C

Covering Letter and Consent Form

Dear Colleague

My name is Emily Williams and I am currently working for _____ Educational Psychology Service whilst I complete my Doctorate in Applied Educational Psychology at the University of Nottingham.

As part of my training I am required to conduct a research study to evaluate the effectiveness of interventions aimed at improving outcomes for children and young people.

My study focuses on exploring the effectiveness of Social Story™ interventions for supporting children with a diagnosis of an Autistic Spectrum Disorder (ASD). A Social Story™ is a short story that is written to describe and explain what happens in a particular social situation in which the child is encountering difficulties.

Research has demonstrated that they can be effective in addressing a range of target behaviours and increasing appropriate social responses such as:

- Raising a hand to answer questions in class;
- Asking questions in class;
- Listening to the teacher;
- Sitting appropriately on the carpet / in assembly;
- Learning to stay calm in the classroom;
- What to do at breaktime;
- What to do at lunch time;
- Washing hands etc

My aim is to work alongside staff from _____'s Autism Outreach Service (AOS) to identify children in school with a diagnosis of an ASD who may benefit from a Social Story™ intervention with a view to implementing and evaluating the impact of the approach.

Having previously worked as a teacher and a SENCO in a Dudley primary school, I appreciate the time restraints and demands on school staff. With this in mind I would like to reassure you that this study will require minimal input from school staff. The Social Stories™ will be written by me and a member of staff from the AOS and the process would simply involve:

- an initial meeting with the class teacher, parent(s)/caregivers and the child to provide more detailed information about the project, gather information and identify a specific behaviour;
- the child's teacher completing short pre-intervention questionnaires;

- the child's teacher or teaching assistant recording the frequency of this behaviour over a 6 week period on a tally chart;
- the child's teacher or teaching assistant reading the Social Story™ daily for 2 weeks;
- the child's teacher completing short post-intervention questionnaires.

I have an enhanced CRB disclosure form and can assure you that all of the work will be carried out professionally in line with the ethical guidelines of the British Psychological Society. These guidelines stipulate that all data obtained will be kept confidential and ensure the right to withdraw from the study at any time. I would ensure that parents were informed and had given consent for their child to participate in the study. On completion I will be happy to offer feedback both in person and by means of an Executive Summary of the study, to all those involved

I hope that in addition to assisting me in my training, the study will also be beneficial to your staff and the children and families involved.

Thank you for your time.

Yours sincerely,

Emily Williams (Trainee Educational Psychologist)

Dear Parent / Guardian

My name is Emily Williams and I am currently working for _____ Educational Psychology Service whilst I complete my Doctorate in Applied Educational Psychology at the University of Nottingham.

As part of my training I am required to conduct a research study to evaluate the effectiveness of interventions aimed at improving outcomes for children and young people.

My study focuses on exploring the effectiveness of Social Story™ interventions for supporting children with a diagnosis of an Autistic Spectrum Disorder (ASD) or children who are presenting with social, emotional and behavioural needs in school. A Social Story™ is a short story that is written to describe and explain what happens in a particular social situation in which the child is encountering difficulties.

The study would involve me working alongside a member of staff from the Autism Outreach Service and your child's class teacher or teaching assistant to develop a short story aimed at describing and explaining particular social situations and changing specific targeted behaviours. Once the story has been written it will then be read with your child on a daily basis by a member of staff in school and data will be recorded to measure its effectiveness.

The study will be carried out in line with the British Psychological Society ethical guidelines and as such all data obtained will be kept confidential. Additionally, you or your child could choose to withdraw from the study at any time. On completion of the research I would be happy to meet with you to offer feedback and provide you with an Executive Summary of the study. I hope that in addition to assisting me in my training, the study will also be beneficial to you and your child.

If you are happy for your child to participate could you please complete the consent form enclosed with this letter and return the signed copy to school.
If you have any further questions please feel free to contact me.
Thank you for your time.

Yours sincerely,

Emily Williams (Trainee Educational Psychologist)

## Parent / Guardian Consent Form

I consent to my child participating in a study to investigate the effectiveness of Social Story interventions for supporting children with a diagnosis of an Autistic Spectrum Disorder or children who are presenting with social, emotional and behavioural needs.
I understand that my child and I have the right to withdraw from the study at any time and that all data obtained will be kept anonymous and confidential.

Name of pupil: ..... School: .....

Date of birth: ..... Classteacher: .....

Gender: ..... Year group: .....

Address: .....

..... Home telephone number:

..... .....

Parent(s)/Guardian(s) signature Date:

.....

# APPENDIX D

Pre-intervention Teacher / Teaching Assistant Interview Transcript

## Teacher / Teaching Assistant Interview Transcript:

1. **Could you briefly outline the behaviour that is causing the child and / or you concern?**

2. **Where, when and with whom does this behaviour take place?**

3. **How often does the behaviour occur?**

4. **What behaviour would be preferable for the child and / or you?**

# APPENDIX E

Pre-intervention Child Interview Transcript

## Child Interview Transcript:

1. **Can you tell me what you like doing at home / at school?**

2. **Can you tell me something you think you are good at?**

3. **Can you tell me something you would like to be better at?**

# APPENDIX F

## Operational Definitions of Target Behaviours

| Target Behaviour | Operational Definition |
|---|---|
| Not paying attention in class | Child is not looking at board / worksheet / book; is fiddling with belongings; is out of their seat; is talking / interacting with another child. Child DOES NOT need to be looking at the adult as they may find this uncomfortable. |
| Play-fighting at playtime | Child is observed to engage in inappropriately aggressive behaviour with one or more peers for which he has to be spoken too / disciplined. |
| Not following instructions for lining up | Child does not join the line all when instructed to do so. |
| Getting upset if not the first to answer | Child expresses upset / anger / annoyance if not asked to answer by shouting out / mumbling to himself / refusing to engage in further questions. |
| Forgetting belongings | Child forgets to hang up coat / bring reading book/ lunch box and pencil case into the classroom at the start of the day. |
| Getting upset about playtime | Child gets visibly upset e.g. tearful prior to break-time or after re-entering the classroom / refuses to go out for playtime / remains in the classroom to talk to teaching staff for prolonged period of time after bell has gone. |
| Getting upset about being looked at | Child complains to teaching assistant that another child is staring at him / leaves his desk / hides his face / shouts at child he perceives is looking. |
| Leaving the classroom during lessons | Child leaves the classroom without requesting permission to do so at any time during the lesson |
| Not paying attention in class | Child is not looking at board / worksheet / book; is fiddling with belongings; is out of their seat; is talking / interacting with another child. Child DOES NOT need to be looking at the adult as they may find this uncomfortable. |
| Pushing in the line when lining up | Child is observed to push other children out of the ay in order to be either first or last in the line. |

# Appendix G

Behaviour Log

| Day | Tally | Total |
| --- | --- | --- |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |

| Day | Tally | Total |
| --- | --- | --- |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |

| Day | Tally | Total |
| --- | --- | --- |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |

# APPENDIX H

Strengths & Difficulties Questionnaire

# Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain or the item seems daft! Please give your answers on the basis of the child's behaviour over the last six months or this school year.

Child's Name ..... Male/Female

Date of Birth.....

| | Not True | Somewhat True | Certainly True |
|---|---|---|---|
| Considerate of other people's feelings | ☐ | ☐ | ☐ |
| Restless, overactive, cannot stay still for long | ☐ | ☐ | ☐ |
| Often complains of headaches, stomach-aches or sickness | ☐ | ☐ | ☐ |
| Shares readily with other children (treats, toys, pencils etc.) | ☐ | ☐ | ☐ |
| Often has temper tantrums or hot tempers | ☐ | ☐ | ☐ |
| Rather solitary, tends to play alone | ☐ | ☐ | ☐ |
| Generally obedient, usually does what adults request | ☐ | ☐ | ☐ |
| Many worries, often seems worried | ☐ | ☐ | ☐ |
| Helpful if someone is hurt, upset or feeling ill | ☐ | ☐ | ☐ |
| Constantly fidgeting or squirming | ☐ | ☐ | ☐ |
| Has at least one good friend | ☐ | ☐ | ☐ |
| Often fights with other children or bullies them | ☐ | ☐ | ☐ |
| Often unhappy, down-hearted or tearful | ☐ | ☐ | ☐ |
| Generally liked by other children | ☐ | ☐ | ☐ |
| Easily distracted, concentration wanders | ☐ | ☐ | ☐ |
| Nervous or clingy in new situations, easily loses confidence | ☐ | ☐ | ☐ |
| Kind to younger children | ☐ | ☐ | ☐ |
| Often lies or cheats | ☐ | ☐ | ☐ |
| Picked on or bullied by other children | ☐ | ☐ | ☐ |
| Often volunteers to help others (parents, teachers, other children) | ☐ | ☐ | ☐ |
| Thinks things out before acting | ☐ | ☐ | ☐ |
| Steals from home, school or elsewhere | ☐ | ☐ | ☐ |
| Gets on better with adults than with other children | ☐ | ☐ | ☐ |
| Many fears, easily scared | ☐ | ☐ | ☐ |
| Sees tasks through to the end, good attention span | ☐ | ☐ | ☐ |

Signature ..... Date .....

Parent/Teacher/Other (please specify:)

**Thank you very much for your help**

# APPENDIX I

Pre and post Teacher / Teaching Assistant Questionnaires

## Pre-Intervention Questionnaire

Child's name: Age:

School:

Year Group:

Could you briefly outline the inappropriate behaviour that you are hoping to discourage and the desirable behaviour that you are hoping to encourage through the use of the Social Story:

What strategies are you currently using to address this behaviour?

How challenging / disruptive / inappropriate do you currently find the behaviour to be?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|

Not Very Very

## Post-Intervention Questionnaire

Your name:

Job Title

Child's name: Age:

School:

Year Group:

Could you briefly outline the child's behaviour now, in the light of the inappropriate behaviour that you were hoping to discourage and the desirable behaviour that you were hoping to encourage through the use of the Social Story™:

How challenging / disruptive are you finding the behaviour to be now?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|

*Not at all Challenging* *Very Challenging*

How effective did you find the Social Story™ to be in addressing specific behaviours?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|

*Not at all effective* *Very effective*

How easy did you find it to implement the Social Story™ intervention?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|

*Not at all easy* *Very easy*

Would you consider using a Social Story™ intervention again?

Any other comments:

Thanks for taking the time to complete this questionnaire. Your dedication and commitment throughout the process has been much appreciated!

Emily Williams (Trainee Educational Psychologist)

# Appendix J

## Social Story Checklist and Guidelines

**Social Story Guidelines & Checklist**

- Briefly explain the purpose of the Social Story prior to the first reading e.g. this is a story that has been written especially for you to help you to…

- Read the story to the child in a location with few distractions

- On completion of the first reading ensure the child understands the story by asking a few simple comprehension questions e.g. Can you tell me what the story was about? What does it suggest you do when…? etc

- Continue to read the story every day for the first week and every other day for the second week.

- If possible, the same person should read the story at approx the same time each day e.g. either at the start of each day or prior to the target situation.

- The story can be referred to as a prompt if the target behaviour occurs and this should be recorded on the checklist.

**Thank you for your support and hard work,**

**Emily Williams (Trainee Educational Psychologist)**

| Day | Social Story Read e.g. Yes at 10:00 by Mrs Smith (TA) | Prompts Given e.g. Yes. Class Teacher reminded Tom about his story when he shouted out |
|---|---|---|
| Monday | | |
| Tuesday | | |
| Wednesday | | |
| Thursday | | |
| Friday | | |
| Monday | | |
| Wednesday | | |
| Friday | | |

# Appendix K

Cohen's Kappa Confusion Matrix

Raters were asked whether or not they believe there had been a practically significant change in performance across the phases on a 5 point scale (relating to the 5 components) ranging from 1 (strongly disagree) to 5 (strongly agree). The Confusion Matrix below reveals the scores that were given.

| | | Rater A | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | T |
| Rater B | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 2 | 0 | 0 | 2 |
| | 4 | 0 | 0 | 1 | 2 | 2 | 5 |
| | 5 | 0 | 0 | 0 | 0 | 3 | 3 |
| | T | 0 | 0 | 3 | 2 | 5 | 10 |

| Kappa with Linear Weighting | | |
|---|---|---|
| Observed Kappa | .95 Confidence Interval | |
| | Lower Limit | Upper Limit |
| 0.6591 | 0.3282 | 0.99 |

# Appendix L

## Examples of Social Stories

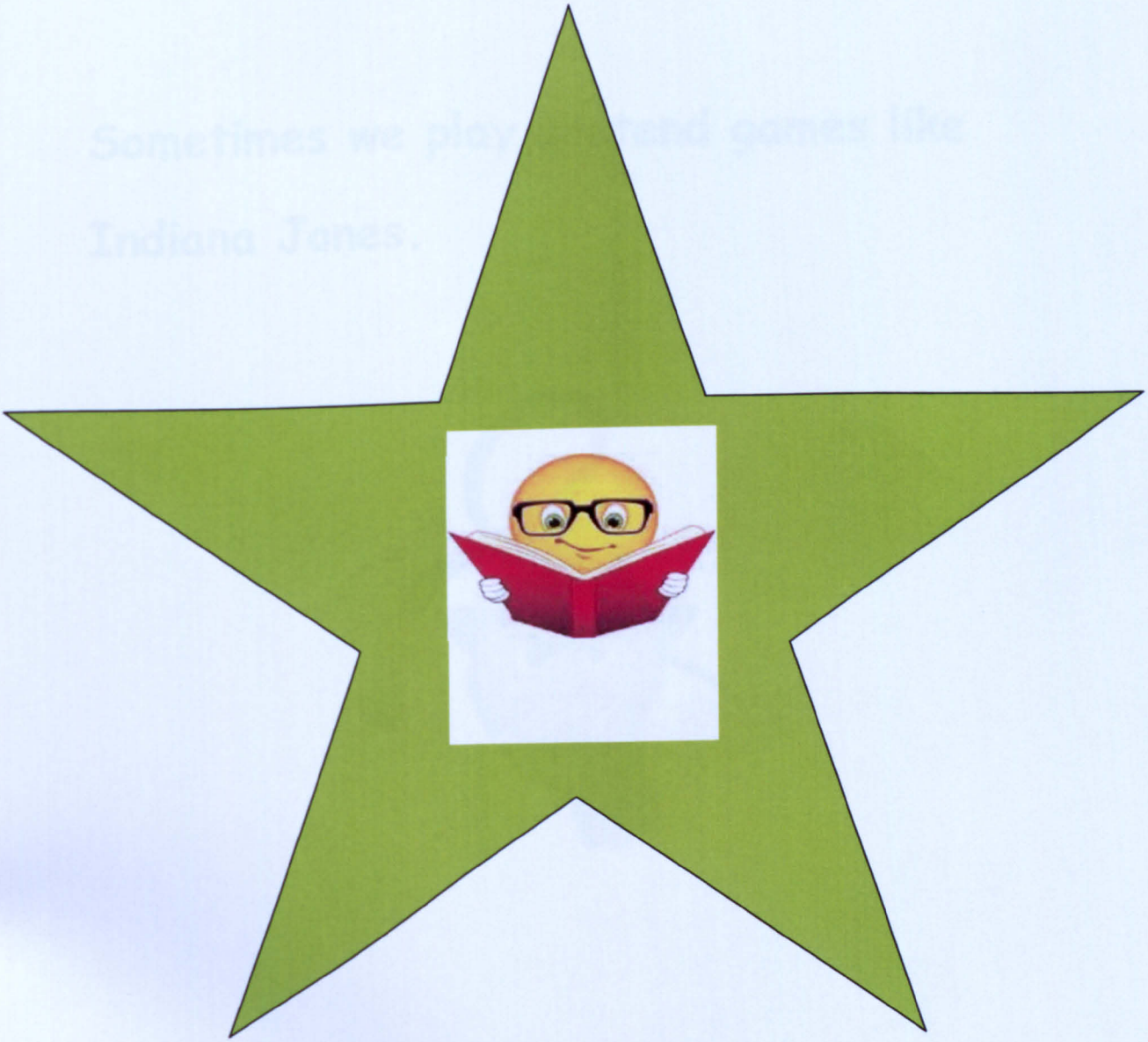
# A story about playtime

for

My name is [ ] and I am in Year Four at [ ] Primary School.

At home I enjoy playing Kung Fun Panda and Indiana Jones on the computer and I like going swimming and playing football.

At school I have been doing really well with my work in the classroom and my teachers are very proud of me.



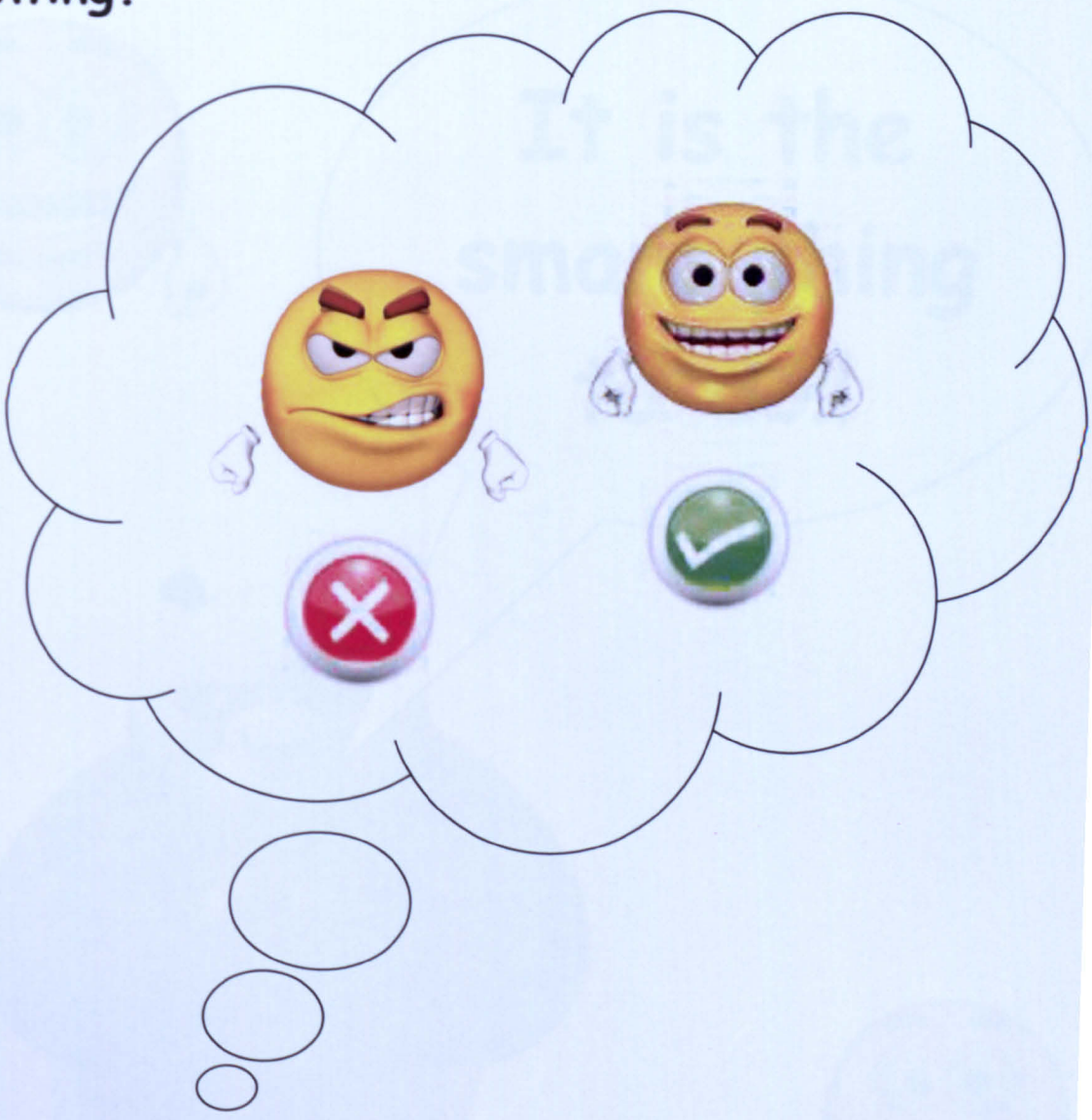
When it is playtime I get to go outside and play with my friends.

Sometimes we play chasing games.

Sometimes we play pretend games like Indiana Jones.

Sometimes the games can get rough and children end up fighting.

When I go out to play I will try to remember not to be too rough and end up fighting.



This will make my friends and my teachers very happy.

It is the smart thing to do!!

# A story about answering questions in class


for

My name is _____ and I am in Year One at _____ Primary School.


At home I enjoy playing games on the computer, drawing and watching Raven and Ben 10 on the television.


At school I am very clever and I am a really fast runner.

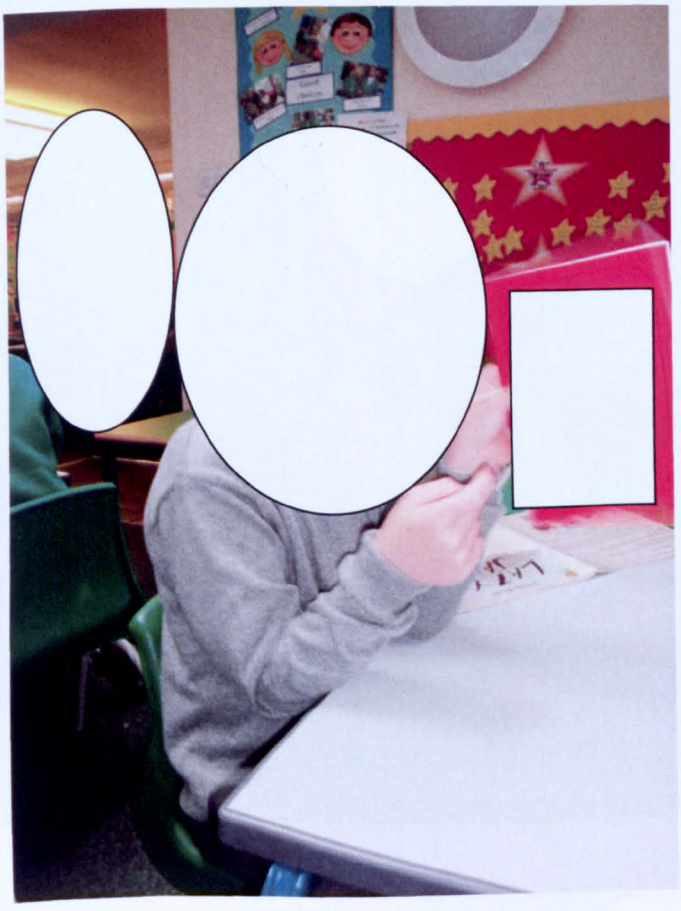
There are many other children in my class at school.

When the teacher is talking to the class, the children are usually quiet and they sit sensibly. When someone wants to say something, they usually put their hand up and wait for the teacher to speak to them.

When I want to say something, I will try to remember to put my hand up and wait to see if the teacher speaks to me.

Sometimes the teacher will ask the children questions. Sometimes she will ask me to answer. Sometimes she may ask another child. I may be called next time.

It is important to take turns to answer questions. It is important for all of the children to get a chance to speak.



My teacher will be happy if I remember to sit quietly and sensibly and put my hand up to talk.

My teacher will be happy if I remember to take turns and let other children answer questions.